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SUGAR BULLETIN No. 24.

DEPARTMENT OF AGRICULTURE,
BRITISH GUIANA.

FIELD EXPERIMENTS WITH SUGAR CANE, XXIV.

THE VARIETY AND FERTILIZER POSITION OF THE SUGAR INDUSTRY, XXI.

REPORT ON THE SUGAR EXPERIMENT STATIONS FOR THE YEAR 1955.

THE HISTORY OF "LEAF SCALD" DISEASE IN BRITISH GUIANA, 1950 — 1956.

U.C.P.
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FIELD EXPERIMENTS WITH SUGAR CANE, XXIV.

BY

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INTRODUCTION.

This paper summarises the results of seventy-six (76) Cane Variety Experiments and one (1) Cultivation Experiment reaped during 1955.

RAINFALL.

The rainfall at the Sugar Experiment Station during 1955 was 123.93 inches which is 21.35 inches more than the average annual rainfall over the period 1921—1954. It should be noted that 1955 is the eighth consecutive year that rainfall in excess of the annual average has been recorded at the Station.

The monthly distribution of the rainfall in 1955 is compared with the monthly averages at the Experiment Station for the period 1921—1954 in Table I. It will be observed that the distribution was rather unusual in that the 1955 rainfall was in general in excess of average during the normal crop periods but below the average during the normally heavy mid-year rainy season.

TABLE I.—**Comparison of the Monthly Rainfall at Sophia Experiment Station for 1955 with the average for 1921—1954.**

Month.	Actual Rainfall, 1955. Inches.	Average Rainfall, 1921—1954. Inches.	Excess or Deficit Inches.
January 1955	11.36	10.70	.66
February „	7.07	5.05	2.02
March „	17.14	4.66	12.48
April „	3.55	7.16	— 3.61
May „	9.41	12.82	— 3.41
June „	10.87	14.96	— 4.09
July „	10.44	11.87	— 1.42
August „	4.76	8.09	— 3.33
September „	8.40	3.07	5.33
October „	3.36	3.88	— .52
November „	17.50	6.22	11.28
December „	20.07	14.11	5.96
Total	123.93	102.58	21.35

VARIETY TRIALS.

The results of the 1955 series of Variety Trials are presented and discussed under the following sub-heads:—

A. Variety Sorting Trials;

B. Plant Cane Variety Trials;

C. First Ratoon Variety Trials;

D. Second Ratoon Variety Trials;

E. Variety Performance Summary;

F. General Summary and Recommendations;

A. VARIETY SORTING TRIALS.

Four Variety Sorting Trials were reaped as Plants in 1955. In two of these, the varieties therein consisted of the Barbados 1950 series of seedlings. One of these trials was planted at the Sugar Experiment Station and the other at Uitvlugt Estate on a pegassy clay.

The other two plant cane sorting trials were laid down at the Sugar Experiment Station and consisted of the Demerara 1952 crosses.

The two First Ratoon Sorting Trials consisted of the Barbados 1949 series of seedlings, while one of the Second Ratoon Sorting Trials consisted of the Barbados 1948 series and the other of various seedlings.

The more promising varieties in these trials are being further tested in large scale field trials.

The results of these series of Sorting Trials are summarised in Table II and are classified according to soil type and locality as follows :—

Soil Type and Locality.	Index Nos. of Trials.	No. of Trials.
Frontland Clay—Sophia	51, 82, 104, 105, 106	5
Pegassy Clay—Uitvlugt	52, 83, 107.	3

TABLE II.—**Results of Plant Cane "Variety Sorting" Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Trial No.
					Tons.	% Mean.	
	Sophia, Field 13 East "B." Reaped 6.4.55 at 12.25 months. Rainfall :—186.85 inches.						
MEANS OF 4 PLOTS :	B. 49119	41.49	15.47	90.8	6.42	119.78	104
	*B. 41227	43.29	14.75	90.2	6.38	119.03	
	B. 50267	43.94	14.47	89.8	6.36	118.66	
	B. 50347	43.78	14.02	89.1	6.14	114.55	
	B. 50135	40.25	14.96	88.9	6.02	112.31	
	B. 50112	40.37	14.85	90.2	5.99	111.75	
	B. 50155	45.56	13.05	87.2	5.94	110.82	
	B. 50311	40.91	13.91	88.6	5.69	106.16	
	B. 50345	35.76	15.83	91.8	5.66	105.60	
	B. 5011	36.65	14.88	88.0	5.46	101.87	
	B. 50352	40.17	13.49	87.4	5.42	101.12	
	B. 50115	38.94	13.86	88.9	5.40	100.75	
	B. 50268	37.44	14.18	89.6	5.31	99.07	
	B. 5037	35.93	14.71	90.8	5.28	98.51	
	B. 50141	35.46	14.82	87.9	5.26	98.13	
	B. 50370	35.57	14.70	89.0	5.23	97.57	
	B 50126	32.66	15.47	89.9	5.05	94.22	
	B. 5019	34.57	14.34	89.3	4.96	92.54	
	B. 50109	35.87	13.63	87.9	4.89	91.23	
	B. 50153	32.09	14.97	88.3	4.81	89.74	
	B. 50377	33.58	14.18	88.9	4.76	88.81	
	B. 50166	31.85	14.27	85.1	4.55	84.89	
	B. 50210	34.52	12.91	85.3	4.46	83.21	
	B. 5073	38.78	11.20	85.3	4.34	80.97	
	B. 5047	28.89	14.81	89.0	4.28	79.85	
	Mean :				5.36	100.00	
	Significant Difference, 20 : 1 :				1.04	19.40	

* **Standard Cane.**

TABLE II. (Contd.)—**Results of Plant Cane "Variety Sorting" Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Trial No.
					Tons.	% Mean.	
	Sophia, Field 5 East "B." Reaped 4.8.55 at 14.00 months. Rainfall :—183.49 inches.						
MEANS OF 4 PLOTS :	D. 13/52	58.10	13.80	85.6	8.02	118.99	105
	D. 26/52	49.96	15.60	89.8	7.79	115.58	
	D. 35/52	51.11	15.05	89.9	7.69	114.09	
	D. 6/52	52.15	14.40	88.6	7.51	111.42	
	D. 14/52	58.23	12.74	83.6	7.42	110.09	
	D. 48/52	56.59	12.95	86.7	7.33	108.75	
	D. 30/52	43.59	16.71	91.0	7.28	108.01	
	D. 22/52	46.43	15.56	88.3	7.22	107.12	
	D. 28/52	52.26	13.73	84.1	7.17	106.38	
	D. 47/52	44.67	15.03	89.6	7.09	105.19	
	D. 8/52	50.00	14.17	87.6	7.09	105.19	
	D. 21/52	49.44	14.22	88.9	7.03	104.30	
	D. 2/52	43.63	15.95	91.5	6.96	103.26	
	D. 12/52	45.68	14.63	89.1	6.68	99.11	
	D. 27/52	50.72	13.15	85.0	6.67	98.96	
	D. 42/52	44.08	14.81	88.3	6.53	96.88	
	***B. 41227**	**43.51**	**14.81**	**90.2**	**6.44**	**95.55**	
	D. 4/52	43.97	14.22	88.1	6.25	92.73	
	D. 31/52	43.43	13.69	89.8	5.94	88.13	
	D. 18/52	46.51	12.76	85.2	5.93	87.98	
	D. 9/52	43.80	13.29	88.0	5.82	86.35	
	D. 1/52	39.75	14.62	89.6	5.81	86.20	
	D. 24/52	42.32	13.72	88.3	5.81	86.20	
	D. 33/52	45.55	12.46	84.3	5.67	84.12	
	D. 23/52	43.70	12.42	84.1	5.42	80.42	
	Mean :				6.74	100.00	
	Significant Difference, 20:1:				1.30	19.29	

* **Standard Cane.**

TABLE II. (Contd.)—**Results of Plant Cane "Variety Sorting" Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Trial No.
					Tons.	% Mean.	
	Sophia, Field 5 East "A." Reaped 9.8.55 at 14.25 months. Rainfall :—185.09 inches.						
MEANS OF 3 PLOTS :	D. 44/52	55.63	14.58	86.6	8.11	131.66	106
	D. 11/52	58.19	13.69	87.8	7.97	129.38	
	D. 40/52	50.09	15.88	90.6	7.96	129.22	
	D. 49/52	54.36	13.37	87.3	7.27	118.02	
	D. 19/52	49.90	14.19	90.0	7.08	114.93	
	D. 34/52	51.88	13.07	87.2	6.78	110.06	
	D. 46/52	44.89	14.64	90.2	6.57	106.66	
	D. 38/52	51.09	12.84	86.9	6.56	106.49	
	***B. 41227**	**43.64**	**14.21**	**90.2**	**6.20**	**100.65**	
	D. 43/52	41.61	14.86	90.9	6.18	100.32	
	D. 56/52	46.31	13.31	86.1	6.16	100.00	
	D. 45/52	42.54	14.46	90.5	6.15	99.84	
	D. 57/52	40.13	15.30	91.5	6.14	99.68	
	D. 55/52	42.83	14.26	86.9	6.11	99.19	
	D. 17/52	41.62	14.61	90.6	6.08	98.70	
	D. 54/52	51.11	11.70	83.7	6.02	97.73	
	D. 39/52	45.45	12.79	84.6	5.81	94.32	
	D. 37/52	41.99	13.41	87.9	5.63	91.40	
	D. 20/52	45.00	12.43	83.8	5.59	90.75	
	D. 25/52	41.71	13.37	87.8	5.58	90.58	
	D. 36/52	34.91	15.41	89.5	5.38	87.34	
	D. 15/52	46.14	10.89	82.9	5.02	81.49	
	D. 52/52	34.20	14.56	90.0	4.98	80.84	
	D. 29/52	35.68	12.75	84.3	4.55	73.86	
	D. 50/52	35.45	11.83	84.6	4.19	68.02	
	Mean :				6.16	100.00	
	Significant Difference, 20 : 1 :				1.48	24.03	

* **Standard Cane.**

TABLE II. (Contd.)—**Results of a First Ratoon "Variety Sorting" Trial on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Combined results for 2 Crops, Plants and 1st Ratoons.		Trial No.
					Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.	
	Sophia, Field 4 West "A." Reaped 20.4.55 at 11.50 months. Rainfall :—162.27 inches.								
	*B. 41227	39.99	14.85	90.2	5.94	128.02	*B. 41227	15.23	
	B. 49354	34.64	15.97	89.2	5.53	119.18	B. 49353	14.37	
	B. 4966	36.67	14.70	87.2	5.39	116.16	B. 49354	14.34	
	B. 49257	41.26	13.07	84.3	5.39	116.16	B. 49257	14.06	
	B. 4956	37.46	14.22	90.0	5.33	114.87	B. 4942	13.73	
	B. 49197	35.40	14.97	89.2	5.30	114.22	B. 49122	13.42	
	B. 49122	35.64	14.69	91.3	5.23	112.72	B. 4995	12.97	
	B. 49380	36.59	13.99	89.0	5.12	110.34	B. 4956	12.79	
	B. 4995	33.94	15.01	91.3	5.09	109.70	B. 49377	12.70	
	B. 49353	31.08	16.29	91.6	5.06	109.05	B. 49380	12.48	
	B. 4942	31.27	16.02	90.0	5.01	107.97	B. 49197	12.29	
	B. 49377	34.25	14.18	85.9	4.85	104.53	B. 4966	12.26	
	B. 49309	31.96	14.70	88.8	4.70	101.29	B. 49186	11.82	
MEANS OF 4 PLOTS:	B. 49355	28.91	15.35	88.3	4.44	95.69	B. 4906	11.61	82
	B. 4906	31.63	13.97	86.9	4.42	95.26	B. 49376	11.42	
	B. 49301	27.32	15.04	91.2	4.11	88.58	B. 49355	11.31	
	B. 49376	25.71	15.53	90.0	3.99	85.99	B. 49309	11.27	
	B. 49186	26.10	14.83	90.2	3.87	83.41	B. 49301	10.65	
	B. 4968	24.40	15.44	87.0	3.77	81.25	B. 4905	10.37	
	B. 49388	27.58	13.46	85.7	3.71	79.96	B. 49229	10.37	
	B. 4945	22.80	15.59	90.8	3.55	76.51	B. 4968	9.95	
	B. 4905	23.41	14.56	88.2	3.41	73.49	B. 49388	9.79	
	B. 49229	22.23	15.32	90.3	3.40	73.28	B. 4945	9.29	
	Mean :				4.64	100.00			
	Significant Difference, 20 : 1 :				.90	19.40			

Results of a Second Ratoon "Variety Sorting" Trial on Demerara Frontland Clay.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Combined results for 3 Crops, Plants, 1st and 2nd Ratoons.		Trial No.
					Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.	
	Sophia, Field 8 West. Reaped 24.3.55 at 12.50 months. Rainfall:—184.84 inches.								
	B. 46378	35.89	15.64	89.8	5.61	139.21	*B. 41227	19.08	
	*B. 41227	34.42	15.84	90.2	5.45	135.24	B. 46378	17.63	
	B. 37161	31.61	13.89	88.4	4.39	108.93	B. 37161	17.18	
	D. 62/43	34.32	12.44	86.2	4.27	105.96	D. 62/43	16.78	
MEANS OF 5 PLOTS:	B. 48372	28.38	13.71	86.1	3.89	96.53	B. 48372	13.66	
	B. 4362	21.62	15.70	90.7	3.40	84.37	B. 4362	13.14	51
	B. 4098	17.07	15.32	89.9	2.61	64.76	B. 4098	11.60	
	B. 4373	18.92	13.81	87.9	2.61	64.76	B. 4373	10.90	
	Mean :				4.03	100.00			
	Significant Difference, 20 : 1 :				.90	22.33			

* **Standard Cane.**

TABLE II. (Contd.)—**Results of a Plant Cane "Variety Sorting" Trial on Pegassy Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Trial No.
					Tons.	% Mean.	
	Pln. De Kinderen, Field W. 78. Reaped 28.4.55 at 12.25 months. Rainfall:—165.29 inches.						
	***B. 41227**	**40.71**	**16.07**	**86.8**	**6.54**	**152.80**	
	B. 50268	37.49	14.10	83.2	5.28	123.36	
	B. 50166	31.86	15.91	89.0	5.07	118.46	
	B. 50267	35.82	13.76	79.3	4.93	115.19	
	B. 50115	36.29	12.69	78.7	4.60	107.48	
	B. 50126	29.76	15.33	82.8	4.56	106.54	
	B. 50311	35.82	12.43	73.4	4.45	103.97	
	B. 49119	30.15	14.55	80.5	4.39	102.57	
	B. 50135	29.49	14.79	83.4	4.36	101.87	
MEANS OF 4 PLOTS:	B. 50352	30.87	14.10	83.4	4.35	101.64	107
	B. 5037	27.99	15.41	88.4	4.31	100.70	
	B. 50155	30.30	13.59	84.9	4.12	96.26	
	B. 5047	27.60	14.61	84.7	4.03	94.16	
	B. 50210	27.52	14.55	84.3	4.00	93.46	
	B. 50345	23.11	16.77	90.6	3.87	90.42	
	B. 50370	24.76	15.52	87.5	3.84	89.72	
	B. 50347	26.62	14.21	83.6	3.78	88.32	
	B. 5098	21.77	14.33	86.3	3.12	72.90	
	B. 50141	22.75	13.11	81.0	2.98	69.63	
	B. 50377	22.90	13.00	83.5	2.97	69.39	
	Mean:				4.28	100.00	
	Significant Difference, 20 : 1 :				.99	23.13	

* **Standard Cane.**

TABLE II. (Contd.)—**Results of a First Ratoon "Variety Sorting" Trial on Pegassy Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
	Pln. Uitvlugt, Field 71 M.Z.E. Reaped 1.9.55 at 11.50 months. Rainfall :—106.77 inches.								
MEANS OF 4 PLOTS:	B. 49354	30.87	15.13	88.4	4.67	156.81	B. 4942	10.19	83
	*B. 41227	33.89	13.64	88.4	4.62	155.13	B. 37161	10.03	
	B. 49380	32.76	13.03	84.9	4.27	143.37	B. 49354	9.98	
	B. 4942	28.21	14.49	88.4	4.09	137.33	*B. 41227	9.66	
	B. 37161	28.13	14.29	90.0	4.02	134.98	B. 49377	8.88	
	B. 49377	27.68	12.36	77.3	3.42	114.83	B. 49380	8.63	
	B. 49309	27.37	12.20	82.6	3.34	112.15	B. 49122	8.48	
	B. 4956	28.12	11.20	83.6	3.15	105.77	B. 4995	8.36	
	B. 49353	22.43	13.96	85.5	3.13	105.10	B. 4956	8.31	
	B. 4966	24.29	12.86	83.5	3.12	104.76	B. 49353	8.04	
	B. 4995	21.32	14.28	89.2	3.04	102.07	B. 49309	7.49	
	B. 49388	24.16	12.18	81.8	2.94	98.72	B. 49186	7.41	
	B. 49122	21.26	13.78	88.9	2.93	98.38	B. 4906	7.32	
	B. 4968	21.21	13.51	81.1	2.87	96.37	B. 4966	7.18	
	B. 49197	22.05	12.24	80.8	2.70	90.66	B. 49197	6.87	
	B. 49301	21.07	12.35	84.6	2.60	87.30	B. 4968	6.66	
	B. 4906	21.98	11.65	82.8	2.56	85.96	B. 49301	6.63	
	B. 49186	19.34	11.69	78.9	2.26	75.88	B. 49388	6.60	
	B. 49166	16.01	11.93	83.8	1.91	64.13	B. 49166	6.11	
	B. 49229	13.24	13.96	87.1	1.85	62.12	B. 4905	5.75	
	B. 4905	10.86	11.48	84.0	1.25	41.97	B. 49229	5.39	
	B. 4970	6.98	12.42	84.3	.87	29.21	B. 4970	4.12	
	Mean :				2.98	100.00			
	Significant Difference, 20 : 1:				.74	24.83			

Results of a Second Ratoon "Variety Sorting" Trial on Pegassy Clay.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
	Pln. De Kinderen, Field 73 De K. Reaped 16.4.55 at 12.50 months. Rainfall :—178.87 inches.								
MEANS OF 5 PLOTS:	*B. 41227	32.22	13.24	89.6	4.27	131.38	B. 48372	14.92	52
	B. 48372	28.46	12.73	84.5	3.62	111.38	*B. 41227	14.60	
	B. 4867	23.48	11.32	77.5	2.66	81.85	B. 4867	9.79	
	B. 4881	23.45	10.46	75.0	2.45	75.38	B. 4881	9.16	
	Mean :				3.25	100.00			
	Significant Difference, 20 : 1:				.65	20.00			

*** Standard Cane.**

B. PLANT CANE VARIETY TRIALS.

Twenty-four Variety Trials were reaped as Plants during 1955, the results of which are presented in Table III. These experiments are classified according to soil type and locality as follows :—

Soil Type and Locality	Index Nos. of Trials.	No. of Trials.
Frontland Clay—Demerara	108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120.	13
Frontland Clay—Berbice	121, 122, 123, 124.	4
Riverside Clay	131.	1
Pegassy Clay	125, 126, 127, 128, 129, 130.	6

TABLE III.—Results of Plant Cane Variety Trials on Demerara Frontland Clay.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Trial No.
					Tons.	% Mean.	
Sophia, Field 13 East "A". Reaped 13.4.55 at 12.25 months. Rainfall:—186.40 inches.							
MEANS OF 5 PLOTS:	B. 50275	45.94	14.04	88.1	6.45	114.36	108
	*B. 41227	45.64	13.88	88.5	6.33	112.23	
	B. 5098	45.73	13.20	86.3	6.03	106.91	
	B. 4956	46.97	12.69	85.7	5.96	105.67	
	B. 5041	41.73	14.11	85.9	5.89	104.43	
	B. 5028	41.59	13.93	88.8	5.79	102.66	
	B. 4998	39.00	13.92	87.6	5.43	96.28	
	B. 50184	36.71	14.43	89.5	5.30	93.97	
	B. 4905	34.61	14.40	88.4	4.98	88.30	
	B. 49346	34.54	12.35	84.2	4.26	75.53	
	Mean:				5.64	100.00	
	Significant Difference, 20:1:				.95	16.84	
Sophia, Field 5 West "B". Reaped 7.9.55 at 12.75 months. Rainfall:—141.26 inches.							
MEANS OF 5 PLOTS:	D. 141/46	58.00	14.26	88.2	8.27	124.17	109
	D. 49/46	62.64	11.86	82.8	7.43	111.56	
	*B. 41227	52.31	13.93	89.1	7.29	109.46	
	D. 94/45	49.69	14.00	88.8	6.96	104.50	
	D. 56/45	43.96	15.50	92.1	6.81	102.25	
	D. 62/45	48.72	13.91	88.9	6.78	101.80	
	D. 27/45	49.04	13.74	88.8	6.74	101.20	
	B. 43253	40.16	16.25	90.4	6.53	98.05	
	B. 46218	41.23	14.40	87.8	5.94	89.19	
	D. 275/46	43.75	12.28	85.7	5.37	80.63	
	B. 49197	40.60	12.59	85.7	5.11	76.73	
	Mean:				6.66	100.00	
	Significant Difference, 20:1:				.86	12.91	

* Standard Cane.

TABLE III. (Contd.).—**Results of Plant Cane Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Trial No.
Sophia, Field 5 West "A". Reaped 10.9.55 at 12.75 months. Rainfall :—142.93 inches.							
MEANS OF 5 PLOTS :	*B. 41227	55.80	13.98	90.4	7.80	124.41	110
	B. 45137	52.88	14.55	89.5	7.70	122.81	
	B. 43214	51.78	14.35	89.0	7.43	118.50	
	B. 4362	51.19	14.39	88.7	7.37	117.54	
	B. 46136	47.61	13.77	88.7	6.56	104.63	
	B. 46340	43.05	13.62	88.4	5.86	93.46	
	B. 4373	41.27	13.75	87.2	5.67	90.43	
	B. 45270	51.51	10.94	84.1	5.63	89.79	
	B. 46351	46.74	11.58	85.4	5.41	86.28	
	P.O.J. 3016	36.03	14.01	89.7	5.05	80.54	
	P.O.J. 2967	33.05	13.55	88.9	4.48	71.45	
	Mean :				6.27	100.00	
	Significant Difference, 20 : 1 :				1.23	19.62	
Sophia, Field 10 West "B". Reaped 13.10.55 at 12.25 months. Rainfall :—120.42 inches.							
MEANS OF 5 PLOTS :	*B. 41227	59.64	14.31	86.4	8.53	133.28	111
	D. 94/45	48.19	14.39	88.0	6.93	108.28	
	D. 49/46	56.92	11.88	81.8	6.76	105.62	
	B. 4711	49.64	13.60	84.2	6.75	105.47	
	B. 47399	50.31	12.77	83.4	6.43	100.47	
	D. 56/45	40.20	15.87	89.0	6.38	99.69	
	D. 4/43	46.96	12.05	80.2	5.66	88.44	
	P.O.J. 3016	43.04	13.01	85.9	5.60	87.50	
	P.O.J. 2967	31.26	14.69	87.1	4.59	71.72	
	Mean :				6.40	100.00	
	Significant Difference, 20 : 1 :				.72	11.25	
Sophia, Field 10 West "A". Reaped 17.10.55 at 12.25 months. Rainfall :—120.42 inches.							
MEANS OF 5 PLOTS :	B. 5037	55.19	13.87	87.8	7.66	117.67	112
	B. 50210	56.38	12.64	82.6	7.13	109.52	
	B. 50135	54.59	12.98	84.5	7.08	108.76	
	***B. 41227**	**60.12**	**11.66**	**82.9**	**7.01**	**107.68**	
	B. 50267	61.85	10.72	79.6	6.63	101.84	
	B. 50370	50.54	12.22	85.3	6.18	94.93	
	B. 50268	58.38	10.10	78.2	5.90	90.63	
	B. 50311	54.77	10.26	77.9	5.62	86.33	
	B. 5047	44.90	12.05	82.0	5.41	83.10	
	Mean :				6.51	100.00	
	Significant Difference, 20 : 1 :				1.10	16.90	

* **Standard Cane.**

TABLE III. (Contd.)—**Results of Plant Cane Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Trial No.
	Sophia, Field 10 East "A". Reaped 16.11.55 at 12.25 months. Rainfall :—115.65 inches.						
MEANS OF 5 PLOTS :	*B. 41227	52.95	13.25	8.52	7.02	114.52	113
	D. 141/46	50.06	13.78	86.3	6.90	112.56	
	B. 50135	53.59	12.85	85.9	6.89	112.40	
	D. 49/46	57.01	11.18	80.7	6.37	103.92	
	D. 94/45	45.33	13.75	86.7	6.24	101.79	
	B. 50377	44.86	13.78	84.5	6.18	100.82	
	D. 13/52	47.97	12.85	83.0	6.16	100.49	
	B. 43214	44.54	13.30	83.6	5.92	96.57	
	D. 14/52	53.96	10.88	79.8	5.87	95.76	
	D. 27/45	49.40	11.79	82.4	5.83	95.11	
	D. 2/46	42.38	13.69	87.0	5.80	94.62	
	D. 127/45	48.19	11.87	81.4	5.72	93.31	
	D. 56/45	40.90	13.77	87.4	5.63	91.84	
	P.O.J. 3016	38.18	13.90	89.3	5.31	86.62	
	Mean :				6.13	100.00	
	Significant Difference, 20:1:				.97	15.82	
	Sophia, Field 16 East "B". Reaped 27.11.55 at 12.25 months. Rainfall :—117.56 inches.						
MEANS OF 5 PLOTS :	*B. 41227	49.39	12.80	84.5	6.32	122.96	114
	D. 26/52	40.83	14.89	88.8	6.08	118.29	
	Pindar	42.39	13.70	87.2	5.81	113.03	
	B. 50275	47.47	12.13	84.0	5.76	112.06	
	B. 50155	48.97	11.57	82.5	5.66	110.12	
	D. 10/52	38.92	13.73	86.7	5.34	103.89	
	B. 50377	35.73	14.62	87.2	5.23	101.75	
	P.O.J. 3016	35.70	14.62	90.8	5.22	101.56	
	D 14/52	39.70	12.50	85.2	4.96	96.50	
	B. 50268	41.26	12.01	84.4	4.96	96.50	
	B. 50352	37.83	12.08	85.3	4.57	88.91	
	D. 62/45	33.38	13.21	87.1	4.41	85.80	
	D. 2/46	27.16	14.28	86.5	3.88	75.49	
	D. 94/45	31.90	11.76	85.4	3.75	72.96	
	Mean :				5.14	100.00	
	Significant Difference, 20:1:				1.08	21.01	

*** Standard Cane.**

TABLE III. (Contd.).—**Results of Plant Cane Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Trial No.
					Tons.	% Mean.	
	Sophia, Field 16 East "A". Reaped 1.12.55 at 12.25 months. Rainfall :—120.35 inches.						
MEANS OF 5 PLOTS :	D. 8/52	47.98	13.53	86.1	6.49	120.63	115
	B. 50267	53.48	11.71	82.0	6.26	116.36	
	D. 18/52	45.06	13.69	86.6	6.17	114.68	
	*B. 41227	47.83	12.83	85.8	6.14	114.13	
	D. 141/46	46.95	12.74	86.2	5.98	111.15	
	B. 48372	43.98	13.01	83.3	5.72	106.32	
	B. 47162	41.21	13.25	87.2	5.46	101.49	
	D. 2/52	39.51	13.72	88.3	5.42	100.74	
	D. 12/52	41.58	12.20	83.5	5.07	94.24	
	D. 3/52	46.54	10.77	79.6	5.01	93.12	
	B. 43214	37.60	13.23	84.4	4.97	92.38	
	D. 22/52	39.34	12.19	85.5	4.80	89.22	
	D. 53/52	38.87	10.58	80.7	4.11	76.39	
	D. 1/52	27.49	13.30	86.1	3.66	68.03	
	Mean :				5.38	100.00	
	Significant Difference, 20 : 1 :				.94	17.47	
	Pln. Leonora, Field Edin. 1. Reaped 1.4.55 at 14.00 months. Rainfall:—159.57 inches.						
MEANS OF 5 PLOTS :	*B. 41227	49.12	15.61	90.6	7.67	124.92	116
	D. 49/46	49.02	14.25	87.4	6.99	113.84	
	B. 4744	46.39	14.53	87.8	6.74	109.77	
	B. 4362	41.21	16.24	89.2	6.69	108.96	
	M. 213/40	43.45	13.49	86.9	5.86	95.44	
	B. 43214	41.87	13.95	84.8	5.84	95.11	
	D. 37/45	43.02	12.08	82.8	5.20	84.69	
	M. 134/32	29.71	13.96	87.3	4.15	67.59	
	Mean :				6.14	100.00	
	Significant Difference, 20 : 1 :				.98	15.96	
	Pln. L.B.I., Field 4 F. Reaped 29.3.55 at 13.50 months. Rainfall :—134.06 inches.						
MEANS OF 5 PLOTS :	B. 4362	38.72	14.45	86.4	5.59	112.47	117
	*B. 41227	40.54	13.65	87.9	5.53	111.27	
	B. 4744	40.30	13.46	89.0	5.42	109.05	
	D. 27/45	36.95	13.26	86.0	4.90	98.59	
	B. 43214	38.23	12.76	86.3	4.88	98.19	
	B. 47225	35.70	13.19	87.0	4.71	94.77	
	M. 213/40	35.97	12.18	85.9	4.38	88.13	
	D. 37/45	35.71	12.23	83.9	4.37	87.93	
	Mean :				4.97	100.00	
	Significant Difference, 20 : 1 :				.67	13.48	

* **Standard Cane.**

TABLE III. (Contd.)—**Results of Plant Cane Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Trial No.
Pln. Lusignan, Field 102 M.X.E. Reaped 11.5.55 at 11.50 months. Rainfall :—118.87 inches.							
MEANS OF 5 PLOTS:	B. 4995	36.98	15.13	93.2	5.59	117.44	118
	***B. 41227**	**36.14**	**13.92**	**88.7**	**5.03**	**105.67**	
	B. 49377	34.73	14.37	87.3	4.99	104.83	
	B. 49354	30.95	15.77	90.6	4.88	102.52	
	B. 4942	32.05	14.92	90.1	4.78	100.42	
	B. 49122	33.11	13.56	89.0	4.49	94.33	
	B. 4970	32.59	12.84	88.1	4.19	88.04	
	B. 49197	32.07	12.97	86.4	4.16	87.39	
	Mean :				4.76	100.00	
	Significant Difference, 20 : 1 :				.81	17.02	
Pln. Ogle, Field C.L. 36. Reaped 16.8.55 at 12.75 months. Rainfall :—116.61 inches.							
MEANS OF 5 PLOTS :	B. 49197	52.22	13.27	91.3	6.93	116.28	119
	***B. 41227**	**53.18**	**12.09**	**86.0**	**6.43**	**107.89**	
	B. 4942	50.86	12.23	85.9	6.22	104.36	
	B. 49257	56.42	10.57	82.2	5.96	100.00	
	B. 4906	47.51	12.08	86.5	5.74	96.31	
	B. 49376	49.87	11.45	86.0	5.71	95.81	
	B. 49380	49.66	10.86	83.1	5.39	90.44	
	B. 49309	48.13	11.08	84.2	5.33	89.43	
	Mean :				5.96	100.00	
	Significant Difference, 20 : 1 :				.72	12.08	
Pln. Peter's Hall, Field H.B. 3 East. Reaped 18.8.55 at 14.00 months. Rainfall :—150.37 inches.							
MEANS OF 5 PLOTS :	B. 47225	49.42	14.08	89.5	6.96	116.00	120
	B. 43218	50.06	13.10	85.9	6.56	109.33	
	***B. 41227**	**50.32**	**12.76**	**87.4**	**6.42**	**107.00**	
	B. 4362	42.46	14.54	87.7	6.17	102.83	
	B. 46230	44.97	13.40	87.1	6.03	100.50	
	B. 45137	50.93	11.75	86.5	5.99	99.83	
	M. 423/41	42.36	12.29	85.5	5.21	86.83	
	D. 24/46	37.27	12.35	85.0	4.65	77.50	
	Mean :				6.00	100.00	
	Significant Difference, 20 : 1 :				1.01	16.83	

*** Standard Cane.**

TABLE III. (Contd.)—Results of Plant Cane Variety Trials on Berbice Frontland Clay.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Trial No.
					Tons.	% Mean.	
	Pln. Albion, Field N. 24 A. Reaped 19.4.55 at 12.25 months. Rainfall :—122.38 inches.						
MEANS OF 5 PLOTS :	B. 4995	34.46	15.02	90.0	5.18	122.17	121
	***B. 41227**	**35.85**	**14.01**	**87.6**	**5.02**	**118.40**	
	B. 49354	32.54	15.15	87.8	4.93	116.27	
	B. 4906	29.45	13.64	87.8	4.02	94.81	
	B. 49122	31.18	12.77	85.7	3.98	93.87	
	B. 4966	29.37	12.84	86.4	3.77	88.92	
	B. 49309	28.31	13.07	85.5	3.70	87.26	
	B. 49377	28.45	11.82	79.6	3.36	79.25	
	Mean :				4.24	100.00	
	Significant Difference, 20 : 1 :				.70	16.51	
	Pln. Port Mourant, Field 38 A.E.E. Reaped 17.2.55 at 12.75 months. Rainfall :—107.92 inches.						
MEANS OF 5 PLOTS :	***B. 41227**	**46.87**	**13.86**	**87.2**	**6.49**	**112.45**	122
	B. 4744	50.25	12.63	86.4	6.35	119.81	
	D. 49/46	45.32	13.21	86.5	5.99	113.02	
	B. 43253	35.18	14.41	88.8	5.07	95.66	
	D. 37/45	40.32	12.41	85.1	5.00	94.34	
	M. 423/41	36.95	12.78	84.6	4.72	89.06	
	M. 213/40	36.99	12.30	85.2	4.55	85.85	
	M. 134/32	31.96	13.37	86.8	4.27	80.57	
	Mean :				5.30	100.00	
	Significant Difference, 20 : 1 :				1.01	19.06	
	Pln. Port Mourant, Field T.L. 23. Reaped 23.8.55 at 13.25 months. Rainfall :—107.23 inches.						
MEANS OF 5 PLOTS :	B. 47258	33.93	15.11	88.2	5.13	107.55	123
	B. 45270	35.81	14.29	86.9	5.12	107.34	
	***B. 41227**	**34.12**	**14.77**	**89.2**	**5.04**	**105.66**	
	B. 4362	31.10	16.12	89.6	5.01	105.03	
	B. 46136	33.77	14.57	88.6	4.92	103.14	
	D. 49/46	33.42	13.68	87.2	4.57	95.81	
	B. 46351	30.23	14.57	86.9	4.40	92.24	
	B. 43218	27.37	14.46	85.2	3.96	83.02	
	Mean :				4.77	100.00	
	Significant Difference, 20 : 1 :				—	—	

*** Standard Cane.**

TABLE III. (Contd.)—Results of Plant Cane Variety Trials on Berbice Frontland Clay.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Trial No.
Pln. Rose Hall, Lot 16 Field 34. Reaped 11.5.55 at 14.50 months. Rainfall :—122.79 inches.							
MEANS OF 5 PLOTS:	*B. 41227	39.07	13.77	84.5	5.38	115.20	124
	B. 4942	39.75	13.31	83.9	5.29	113.28	
	B. 4995	38.15	13.40	86.4	5.11	109.42	
	B. 49353	36.52	13.94	83.6	5.09	108.99	
	B. 49257	44.09	10.89	78.1	4.80	102.78	
	B. 49376	34.08	11.78	80.1	4.01	85.87	
	B. 49301	31.95	12.53	82.6	4.00	85.65	
	B. 4945	33.22	11.06	77.1	3.68	78.80	
	Mean:				4.67	100.00	
	Significant Difference, 20 : 1 :				.87	18.63	
Results of a Plant Cane Variety Trial on Riverside Clay.							
Pln. Versailles, Field 1 V. Reaped 11.10.55, at 13.25 months. Rainfall :—113.22 inches.							
MEANS OF 5 PLOTS:	B. 47258	47.88	15.73	88.4	7.53	119.15	131
	B. 4373	47.31	15.56	87.0	7.36	116.46	
	B. 43413	49.03	14.14	82.5	6.93	109.65	
	*B. 41227	47.08	14.45	87.6	6.80	107.59	
	B. 46136	41.96	14.73	85.8	6.18	97.78	
	B. 47379	48.55	12.39	86.2	6.01	95.09	
	P.O.J. 3016	36.81	15.53	90.5	5.72	90.51	
	P.O.J. 2967	30.10	13.33	87.5	4.01	63.45	
	Mean:				6.32	100.00	
	Significant Difference, 20 : 1 :				.79	12.50	
Results of Plant Cane Variety Trials on Pegassy Clay.							
Pln. Diamond, Field G.G. 45. Reaped 28.4.55 at 12.50 months. Rainfall:—175.09 inches.							
MEANS OF 5 PLOTS:	*B. 41227	39.71	13.13	86.4	5.21	117.08	125
	B. 49354	32.07	15.34	90.1	4.92	110.56	
	B. 4942	32.04	14.66	89.4	4.70	105.62	
	B. 49377	32.11	13.80	87.4	4.43	99.55	
	B. 49309	34.36	12.85	88.5	4.41	99.10	
	B. 4966	29.47	14.60	90.4	4.30	96.63	
	B. 49380	33.90	12.18	83.2	4.13	92.81	
	B. 4906	27.42	12.92	87.1	3.54	79.55	
	Mean:				4.45	100.00	
	Significant Difference, 20 : 1 :				.81	18.20	

* Standard Cane.

TABLE III. (Contd.)—**Results of Plant Cane Variety Trials on Pegassy Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Trial No.
Pln. Farm, Field M. 17. Reaped 7.9.55 at 13.25 months. Rainfall:—125.71 inches.							
MEANS OF 5 PLOTS:	M. 213/40	24.94	11.87	86.5	2.96	133.32	126
	B. 43413	23.25	11.20	78.4	2.60	117.10	
	B. 4373	20.88	12.27	79.8	2.56	115.30	
	*B. 41227	22.71	10.75	81.3	2.44	109.90	
	B. 37161	18.62	11.03	82.1	2.05	92.33	
	M. 423/41	19.31	9.82	74.3	1.90	85.58	
	M. 134/32	17.39	10.04	78.3	1.75	78.82	
	B. 47379	16.88	8.91	65.9	1.50	67.56	
	Mean:				2.22	100.00	
	Significant Difference, 20:1:				.72	32.43	
Pln. Leonora, Field L. 65. Reaped 31.3.55 at 15.50 months. Rainfall:—195.71 inches.							
MEANS OF 5 PLOTS:	B. 45137	40.51	13.32	83.6	5.40	124.14	127
	*B. 41227	44.58	11.57	83.1	5.16	118.62	
	B. 47225	40.47	12.03	85.6	4.87	111.95	
	B. 4362	34.28	13.78	87.7	4.72	108.51	
	B. 47258	40.43	11.35	82.6	4.59	105.52	
	B. 4744	31.77	13.72	87.2	4.36	100.23	
	D. 37/45	31.96	11.44	82.5	3.65	83.91	
	B. 4373	19.89	10.45	76.0	2.08	47.82	
	Mean:				4.35	100.00	
	Significant Difference, 20:1:				.52	11.95	
Pln. Leonora, Field 47 G. Reaped 24.11.55 at 13.75 months. Rainfall:—126.80 inches.							
MEANS OF 5 PLOTS:	B. 47258	55.51	14.71	90.1	8.16	122.52	128
	*B. 41227	56.46	14.12	90.1	7.97	119.67	
	B. 37161	54.05	13.54	88.9	7.32	109.91	
	B. 43253	47.17	14.63	88.7	6.90	103.60	
	P.O.J. 3016	46.55	14.67	91.1	6.83	102.55	
	B. 47379	48.57	13.67	87.9	6.64	99.70	
	P.O.J. 2967	43.17	12.37	85.1	5.34	80.18	
	B. 4373	36.68	11.29	76.2	4.14	62.16	
	Mean:				6.66	100.00	
	Significant Difference, 20:1:				1.04	15.62	

* **Standard Cane.**

TABLE III. (Contd.)—**Results of Plant Cane Variety Trials on Pegassy Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Trial No.
					Tons.	% Mean.	
	Pln. Versailles, Field R.D.Z. *20. Reaped 1.3.55 at 13.50 months. Rainfall :—78.15 inches.*						
MEANS OF 5 PLOTS :	*B. 41227	43.22	14.31	88.8	6.18	129.83	129
	B. 4362	38.70	15.40	90.3	5.96	125.21	
	B. 4744	36.39	14.53	89.6	5.29	111.13	
	B. 45137	39.89	13.23	86.0	5.28	110.92	
	B. 43253	28.88	14.37	87.5	4.15	87.18	
	D. 37/45	35.44	11.65	82.6	4.13	86.76	
	D. 158/41	30.99	12.42	83.5	3.85	80.88	
	D. 54/43	28.82	11.13	80.2	3.21	67.44	
	Mean :				4.76	100.00	
	Significant Difference, 20:1 :				1.10	23.11	
	Pln. Wales, Field 53 V.B. Reaped 27.4.55 at 11.00 months. Rainfall :—149.91 inches.						
MEANS OF 5 PLOTS :	B. 47225	38.11	14.18	87.0	5.40	112.97	130
	B. 46378	39.70	13.12	83.3	5.21	109.00	
	B. 43253	34.73	14.96	86.9	5.20	108.79	
	B. 47258	36.45	14.01	83.7	5.11	106.90	
	*B. 41227	35.57	13.95	86.9	4.95	103.77	
	B. 46351	33.95	13.92	84.3	4.72	98.74	
	B. 46136	30.92	12.61	78.1	3.90	81.59	
	M. 423/41	34.06	10.97	76.6	3.74	78.24	
	Mean :				4.78	100.00	
	Significant Difference, 20:1 :				.64	13.39	

* **Standard Cane.**

C. FIRST RATOON VARIETY TRIALS.

Nineteen Variety Trials were reaped as First Ratoon during 1955, the results of which are presented in Table IV. These experiments are classified according to soil type and locality as follows:—

Soil Type and Locality	Index Nos. of Trials.	No. of Trials.
Frontland Clay—Demerara	84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97.	14
Frontland Clay—Berbice	98, 99.	2
Riverside Clay	100.	1
Pegassy Clay	102, 103.	2

TABLE IV.—Results of First Ratoon Variety Trials on Demerara Frontland Clay.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
	Sophia, Field 4 West "B". Reaped 16.4.55 at 11.50 months. Rainfall:—162.03 inches.								
MEANS OF 5 PLOTS:	B. 45270	42.50	13.95	85.9	5.93	113.17	*B. 41227	14.85	84
	*B. 41227	38.12	15.26	91.5	5.82	111.07	D. 54/43	13.73	
	D. 4/43	39.63	13.64	87.4	5.41	103.24	B. 45270	13.60	
	D. 54/43	40.91	12.42	84.6	5.08	96.95	D. 4/43	12.29	
	B. 44279	32.58	14.52	92.2	4.73	90.27	B. 44279	12.27	
	D. 27/45	32.31	13.87	87.3	4.48	85.50	D. 27/45	12.13	
	Mean:				5.24	100.00			
	Significant Difference, 20 : 1 :				.86	16.41			
	Sophia, Field 3 West "B". Reaped 27.4.55 at 11.50 months. Rainfall:—160.71 inches.								
MEANS OF 4 PLOTS:	D. 4/43	31.05	14.98	88.9	4.65	107.64	*B. 41227	13.80	85
	*B. 41227	28.53	16.22	90.7	4.63	107.18	D. 58/43	12.47	
	B. 47225	28.25	16.37	92.4	4.62	106.94	B. 47225	12.45	
	D. 58/43	29.11	14.52	88.7	4.22	97.69	D. 4/43	11.71	
	B. 46218	22.97	17.09	93.0	3.92	90.74	B. 46230	11.67	
	B. 46230	24.38	15.94	88.0	3.88	89.81	B. 46218	11.16	
	Mean:				4.32	100.00			
	Significant Difference, 20 : 1 :				—	—			
	Sophia, Field 2 West "B". Reaped 26.7.55 at 11.00 months. Rainfall:—131.38 inches.								
MEANS OF 4 PLOTS:	*B. 41227	42.75	14.81	89.9	6.33	106.75	D. 133/46	14.19	86
	D. 133/46	48.32	12.97	85.2	6.27	105.73	*B. 41227	13.61	
	D. 2/46	39.89	15.06	87.5	6.01	101.35	D. 2/46	13.32	
	D. 184/46	38.31	13.40	86.5	5.12	86.34	D. 184/46	15.08	
	Mean:				5.93	100.00			
	Significant Difference, 20 : 1 :				—	—			
	Sophia, Field 2 West "A". Reaped 28.7.55 at 11.00 months. Rainfall:—125.87 inches.								
MEANS OF 4 PLOTS:	D. 49/46	48.93	12.82	85.1	6.27	112.37	D. 259/46	14.38	87
	*B. 41227	45.76	13.15	86.0	6.04	108.24	D. 49/46	14.13	
	D. 275/46	42.45	13.97	89.9	5.93	106.27	*B. 41227	12.95	
	D. 259/46	43.89	13.46	88.2	5.91	105.91	D. 275/46	11.80	
	D. 183/46	37.03	13.26	88.7	4.91	87.99	D. 183/46	11.37	
	D. 250/46	37.42	12.38	83.3	4.63	82.97	D. 250/46	10.75	
	Mean:				5.58	100.00			
	Significant Difference, 20 : 1 :				1.15	20.61			

* Standard Cane.

TABLE IV. (Contd.)—**Results of First Ratoon Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane	Purity.	Sucrose in Cane per Acre.		Combined results for 2 Crops, Plants and 1st Ratoons.		Trial No.
					Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.	
	Sophia, Field 2 East "B". Reaped 24.8.55 at 11.25 months. Rainfall :—113.75 inches.								
MEANS OF 4 PLOTS:	D. 141/46	50.17	12.26	86.0	6.15	115.82	D. 133/46	15.02	88
	*B. 41227	44.31	13.70	88.0	6.07	114.31	D. 141/46	14.76	
	D. 133/46	47.06	12.86	87.0	6.05	113.94	*B. 41227	13.80	
	D. 124/45	53.59	9.54	78.1	5.11	96.23	D. 106/46	12.44	
	D. 250/46	41.07	12.33	83.4	5.06	95.29	D. 112/46	11.91	
	D. 91/46	41.78	12.05	85.7	5.03	94.73	D. 250/46	11.75	
	D. 106/46	46.12	10.42	82.0	4.81	90.58	D. 124/45	11.73	
	D. 94/46	40.09	11.85	87.2	4.75	89.45	D. 91/46	11.08	
	D. 112/46	40.65	11.63	86.0	4.72	88.89	D. 94/46	10.28	
	Mean :				5.31	100.00			
	Significant Difference, 20 : 1 :				.85	16.01			
	Sophia, Field 2 East "A". Reaped 26.8.55 at 11.25 months. Rainfall :—113.27 inches.								
MEANS OF 5 PLOTS:	D. 49/46	52.24	12.52	84.1	6.54	125.53	D. 49/46	14.28	89
	D. 184/46	40.90	14.02	88.2	5.73	109.98	*B. 41227	13.02	
	D. 175/46	41.63	13.76	89.3	5.73	109.98	D. 184/46	12.61	
	*B. 41227	43.53	12.89	87.3	5.61	107.68	D. 175/46	12.58	
	D. 92/46	37.66	13.44	88.1	5.06	97.12	D. 183/46	11.52	
	D. 275/46	36.93	11.82	84.7	4.36	83.69	D. 92/46	10.96	
	D. 183/46	30.49	14.18	90.8	4.32	82.92	D. 275/46	10.67	
	D. 98/46	33.67	12.81	87.5	4.31	82.73	D. 98/46	9.29	
	Mean :				5.21	100.00			
	Significant Difference, 20 : 1 :				.81	15.55			
	Sophia, Field 1 East "B". Reaped 30.8.55 at 11.25 months. Rainfall :—113.27 inches.								
MEANS OF 4 PLOTS:	*B. 41227	47.85	12.70	85.7	6.08	114.30	*B. 41227	14.08	90
	D. 56/45	40.92	14.39	90.3	5.89	110.73	D. 23/46	13.64	
	D. 23/46	44.67	12.71	84.7	5.68	106.78	D. 56/45	13.25	
	D. 83/45	40.75	13.88	88.2	5.65	106.22	D. 35/45	12.36	
	D. 4/46	36.84	14.61	88.0	5.38	101.14	D. 83/45	12.03	
	B. 44150	42.34	12.50	86.0	5.29	99.45	B. 44150	11.72	
	D. 35/45	46.19	11.16	83.5	5.15	96.82	D. 177/45	11.65	
	D. 5/46	39.33	12.84	85.6	5.05	94.94	B. 44279	11.44	
	D. 177/45	42.90	11.63	84.3	4.99	93.81	B. 45274	11.44	
	B. 45274	43.75	11.01	81.3	4.82	90.62	D. 4/46	11.42	
	B. 44279	41.54	10.81	81.2	4.49	84.41	D. 5/46	10.91	
	Mean :				5.32	100.00			
	Significant Difference, 20 : 1 :				.64	12.03			

*** Standard Cane.**

TABLE IV. (Contd.)—**Results of First Ratoon Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
Sophia, Field 1 East "A". Reaped 2.9.55 at 11.25 months. Rainfall :—114.22 inches.									
MEANS OF 4 PLOTS :	B. 46103	56.31	11.73	85.4	6.60	116.81	B. 46288	13.44	91
	B. 46288	51.49	12.31	87.4	6.34	112.21	B. 4556	13.26	
	B. 46150	44.98	13.66	86.4	6.14	108.67	*B. 41227	12.73	
	B. 4556	47.17	12.84	85.7	6.05	107.08	B. 46103	12.61	
	*B. 41227	45.26	13.09	87.2	5.92	104.78	B. 46150	12.34	
	B. 46116	44.61	12.44	86.2	5.55	98.23	B. 46384	11.81	
	D. 22/46	39.61	13.65	88.2	5.40	95.57	B. 46308	11.75	
	B. 46384	39.33	13.70	88.4	5.39	95.40	B. 46116	11.67	
	B. 46308	45.44	11.23	83.2	5.10	90.26	D. 22/46	11.42	
	B. 46230	38.39	12.76	85.2	4.90	86.73	B. 46230	10.83	
	D. 33/45	33.82	13.92	87.9	4.71	83.36	D. 33/45	9.26	
	Mean :				5.65	100.00			
	Significant Difference, 20 : 1 :				.84	14.87			
Sophia, Field 15 West "B". Reaped 16.9.55 at 11.50 months. Rainfall :—118.46 inches.									
MEANS OF 3 PLOTS :	D. 49/46	44.29	13.43	87.0	6.00	121.21	B. 47162	11.91	93
	B. 47162	42.82	13.23	87.9	5.66	114.34	D. 49/46	11.24	
	D. 133/46	39.84	13.50	88.2	5.38	108.69	*B. 41227	11.15	
	B. 46369	42.49	12.30	85.9	5.23	105.66	B. 47379	10.74	
	B. 47379	38.72	13.01	87.5	5.04	101.82	D. 158/41	10.43	
	*B. 41227	35.95	13.98	89.1	5.02	101.41	D. 133/46	9.78	
	D. 158/41	34.19	14.20	87.4	4.85	97.98	D. 275/46	8.90	
	D. 275/46	29.62	13.33	87.5	3.95	79.80	D. 183/46	8.53	
	D. 183/46	23.91	14.14	90.7	3.38	68.28	†B. 46369	5.23	
	Mean :				4.95	100.00			
	Significant Difference, 20 : 1 :				.60	12.12			
Sophia, Field 15 West "A". Reaped 16.9.55 at 11.50 months. Rainfall :—118.46 inches.									
MEANS OF 3 PLOTS :	B. 43413	37.77	14.48	87.5	5.47	115.16	B. 4362	13.31	92
	D. 37/45	41.14	13.10	88.4	5.39	113.47	D. 58/43	13.04	
	B. 4744	39.51	12.61	86.5	4.98	104.84	B. 47258	13.03	
	B. 4362	32.78	14.64	88.2	4.80	101.05	B. 4744	12.91	
	D. 58/43	39.36	12.14	85.5	4.78	100.63	D. 37/45	12.50	
	D. 54/43	39.11	12.00	85.2	4.69	98.74	B. 43413	12.45	
	D. 27/45	36.03	12.92	85.6	4.65	97.89	D. 27/45	12.22	
	B. 47258	34.78	13.30	88.0	4.63	97.47	*B. 41227	12.20	
	B. 45137	38.00	12.17	86.8	4.62	97.26	B. 45137	11.27	
	*B. 41227	35.05	12.70	85.6	4.45	93.68	D. 54/43	10.69	
	B. 46290	32.86	11.51	83.7	3.78	79.58	B. 46290	9.82	
	Mean :				4.75	100.00			
	Significant Difference, 20 : 1 :				.65	13.68			

* **Standard Cane.**

† **Result of 1st Ratoon only.**

TABLE IV. (Contd.)—**Results of First Ratoon Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 2 Crops, Plants, and 1st Ratoons. Variety.	Combined results for 2 Crops, Plants, and 1st Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
	Sophia, Field 12 East. Reaped 24.11.55 at 11.50 months. Rainfall :—106.06 inches.								
MEANS OF 4 PLOTS:	*B. 41227	44.39	12.53	85.2	5.56	114.17	*B. 41227	12.56	94
	B. 49122	45.73	12.14	84.7	5.55	113.96	D. 10/44	11.24	
	D. 10/44	45.32	12.03	82.4	5.45	111.91	B. 49380	11.18	
	B. 48372	39.81	13.25	85.1	5.27	108.21	B. 49122	10.95	
	B. 47419	43.83	11.69	83.3	5.12	105.13	B. 4966	10.74	
	B. 47225	39.07	13.04	86.7	5.10	104.72	B. 46351	10.36	
	B. 49380	42.46	11.89	81.8	5.05	103.70	B. 46136	10.35	
	B. 46136	39.27	12.64	83.9	4.96	101.85	B. 48372	10.34	
	B. 49355	38.70	12.79	82.9	4.95	101.64	B. 47225	10.27	
	B. 4966	40.09	12.29	84.2	4.92	101.03	B. 49355	10.21	
	B. 49354	37.65	12.86	83.8	4.84	99.38	B. 49354	10.17	
	B. 46351	40.69	11.49	82.0	4.68	96.10	B. 49377	9.72	
	B. 49377	36.61	12.72	81.0	4.66	95.69	B. 4942	9.23	
	B. 4945	32.90	13.45	87.0	4.42	90.76	B. 4945	8.43	
	B. 4942	38.12	10.98	80.2	4.19	86.04	B. 49388	7.63	
	B. 49388	28.91	10.96	77.5	3.17	65.09	†B. 47419	5.12	
	Mean:				4.87	100.00			
	Significant Difference, 20:1:				1.11	22.79			
	Pln. Enmore, Field Paradise E. 4. Reaped 3.3.55 at 12.25 months. Rainfall :—105.74 inches.								
MEANS OF 5 PLOTS:	B. 46351	40.23	13.06	85.6	5.25	107.36	*B. 41227	10.69	95
	D. 62/43	40.74	12.82	86.0	5.22	106.75	D. 62/43	10.32	
	*B. 41227	42.71	12.00	83.8	5.13	104.91	B. 46351	9.79	
	B. 46378	38.93	12.83	85.1	4.99	102.04	B. 46378	9.76	
	B. 46340	37.25	13.10	88.3	4.88	99.80	B. 46340	9.08	
	B. 46290	38.06	12.37	87.6	4.71	96.32	B. 46290	8.90	
	B. 4744	38.59	10.48	84.5	4.04	82.62	B. 4744	8.51	
	Mean:				4.89	100.00			
	Significant Difference, 20:1:				—	—			
	Pln. L.B.I., Field 82 Success. Reaped 15.4.55 at 11.00 months. Rainfall:—137.17 inches.								
MEANS OF 5 PLOTS:	*B. 41227	36.93	14.43	88.3	5.33	115.12	†B. 41227	11.73	96
	B. 47225	35.29	14.51	87.5	5.12	110.58	B. 47225	11.55	
	B. 45188	34.95	13.54	86.0	4.73	102.16	B. 45270	11.00	
	D. 58/43	35.51	13.18	85.4	4.68	101.08	D. 58/43	10.63	
	B. 45270	37.11	12.57	85.4	4.66	100.65	D. 37/45	9.90	
	D. 37/45	33.59	13.21	85.4	4.44	95.90	B. 45188	9.59	
	D. 54/43	34.27	12.85	84.4	4.40	95.03	D. 54/43	8.65	
	M. 423/41	29.15	12.63	82.7	3.68	79.48	M. 423/41	8.15	
	Mean:				4.63	100.00			
	Significant Difference, 20:1:				.67	14.47			

* Standard Cane.

† Not Reaped as Plants.

TABLE IV. (Contd.)—**Results of First Ratoon Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
	Pln. Lusignan, Field 34 A. Reaped 13.10.55 at 12.00 months. Rainfall:—105.05 inches.								
MEANS OF 5 PLOTS:	*B 41227	35.02	13.99	89.0	4.90	112.13	*B. 41227	10.41	97
	D. 54/43	36.25	13.40	84.8	4.86	111.21	D. 58/43	10.35	
	B. 46218	30.27	15.35	87.4	4.65	106.41	B. 45270	10.28	
	D. 58/43	33.81	13.73	84.5	4.64	106.18	B. 46218	10.00	
	B. 47419	35.20	12.90	86.8	4.54	103.89	D. 4/43	9.90	
	D. 158/41	33.05	13.47	84.8	4.45	101.83	D. 158/41	9.72	
	D. 4/43	31.61	13.99	86.6	4.43	101.37	D. 54/43	9.37	
	B. 45270	37.48	11.75	84.1	4.40	100.69	B. 49388	7.63	
	B. 46290	29.29	11.73	82.3	3.44	78.72	B. 46290	6.93	
	B. 49388	28.67	11.98	81.5	3.43	78.49	†B. 47419	4.54	
	Mean:				4.37	100.00			
	Significant Difference, 20 : 1 :				.86	19.68			
	Results of First Ratoon Variety Trials on Berbice Frontland Clay.								
	Pln. Port Mourant, Field A.E.W. 29. Reaped 25.1.55 at 12.25 months. Rainfall:—113.58 inches.								
MEANS OF 5 PLOTS:	*B. 41227	44.48	14.34	88.5	6.38	105.45	*B. 41227	11.17	98
	B. 48372	47.75	12.55	80.9	5.99	99.01	B. 48372	10.82	
	B. 37161	45.89	12.60	86.9	5.78	95.54	B. 37161	10.51	
	Mean:				6.05	100.00			
	Significant Difference, 20 : 1 :				—	—			
	Pln. Rose Hall, Field Tap. 26. Reaped 29.11.55 at 11.50 months. Rainfall:—79.71 inches.								
MEANS OF 5 PLOTS:	B. 45137	24.65	13.89	84.2	3.42	136.80	*B. 41227	9.78	99
	B. 47258	21.68	13.79	86.0	2.99	119.60	B. 47258	8.84	
	*B. 41227	21.59	13.63	83.5	2.94	117.60	B. 45137	8.51	
	D. 37/45	20.20	13.54	82.3	2.73	109.20	D. 37/45	8.49	
	B. 47225	17.41	13.40	85.6	2.33	93.20	B. 47225	7.57	
	D. 158/41	15.24	13.21	81.5	2.02	80.80	B. 4362	7.04	
	B. 4362	14.93	13.07	81.8	1.95	78.00	D. 158/41	7.01	
	M. 423/41	13.79	11.79	80.9	1.63	65.20	M. 423/41	6.52	
	Mean:				2.50	100.00			
	Significant Difference, 20 : 1 :				.41	16.40			

* **Standard Cane.**

† **Not Reaped as Plants.**

TABLE IV. (Contd.)—**Results of a First Ratoon Variety Trial on Riverside Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 2 Crops, Plants, and 1st Ratoons. Variety.	Combined results for 2 Crops, Plants, and 1st Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
	Pln. Blairmont, Field 8 Riverside. Reaped 15.4.55 at 11.00 months. Rainfall:—89.04 inches.								
MEANS OF 5 PLOTS:	D. 4/43	34.97	12.82	85.8	4.48	121.74	D. 4/43	10.83	100
	*B. 41227	31.28	13.46	88.5	4.21	114.40	*B. 41227	10.76	
	D. 54/43	32.19	12.07	85.1	3.89	105.71	D. 54/43	9.82	
	B. 47225	25.71	14.40	88.5	3.70	100.54	B. 47225	9.52	
	D. 158/41	27.84	12.59	85.4	3.50	95.11	D. 158/41	9.47	
	B. 49388	28.15	11.31	81.7	3.18	86.41	B. 46218	8.21	
	B. 46218	19.86	14.19	88.6	2.82	76.63	B. 49388	7.74	
	Mean:				3.68	100.00			
	Significant Difference, 20:1:				.58	15.76			
	Results of First Ratoon Variety Trials on Pegassy Clay.								
	Pln. Diamond, Field 103/44 G.D. Reaped 26.7.55 at 11.25 months. Rainfall:—132.79 inches.								
MEANS OF 5 PLOTS:	*B. 41227	47.91	13.64	87.3	6.53	120.04	B. 47225	14.55	102
	B. 37161	47.19	13.41	88.5	6.33	116.36	*B. 41227	13.85	
	D. 37/45	47.14	13.10	86.6	6.17	113.42	D. 37/45	13.66	
	B. 47225	41.97	13.64	88.2	5.72	105.15	D. 4/43	12.59	
	D. 58/43	49.31	11.37	80.5	5.61	103.12	B. 45270	12.53	
	D. 4/43	47.57	11.03	77.6	5.25	96.51	D. 54/43	12.32	
	D. 54/43	49.14	10.30	77.2	5.06	93.01	D. 158/41	12.28	
	B. 45270	40.78	12.05	84.9	4.91	90.26	D. 58/43	11.93	
	D. 158/41	49.31	9.06	73.2	4.47	82.17	B. 37161	11.84	
	B. 46218	30.37	14.50	88.4	4.40	80.88	B. 46218	11.16	
	Mean:				5.44	100.00			
	Significant Difference, 20:1:				.78	14.34			
	Pln. Wales, Field 1 Sisters. Reaped 6.4.55 at 11.00 months. Rainfall:—145.55 inches.								
MEANS OF 5 PLOTS:	*B. 41227	43.93	14.66	90.4	6.44	119.70	*B. 41227	11.25	103
	D. 58/43	45.16	12.58	84.2	5.68	105.58	B. 37161	9.76	
	B. 37161	34.39	14.96	91.1	5.15	95.72	D. 58/43	9.48	
	B. 47225	30.53	16.26	92.2	4.96	92.19	B. 47225	9.07	
	D. 54/43	35.68	13.15	84.1	4.69	87.17	D. 54/43	8.41	
	Mean:				5.38	100.00			
	Significant Difference: 20:1:				1.11	20.63			

*** Standard Cane.**

D. SECOND RATOON VARIETY TRIALS.

Twenty-five Variety Trials were reaped as Second Ratoon during 1955, the results of which are presented in Table V. These experiments are classified according to soil type and locality as follows :—

Soil Type and Locality.	Index Nos. of Trials.	No. of Trials
Frontland Clay—Demerara	53, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 72, 73.	19
Frontland Clay—Berbice	74, 75, 76, 77.	4
Riverside Clay	78, 101.	2

TABLE V.—Results of Second Ratoon Variety Trials on Demerara Frontland Clay.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Sucrose in Cane per Acre, Tons.	Trial No
	Sophia, Field 8 East. Reaped 19.3.55 at 12.50 months. Rainfall:—180.68 inches.								
MEANS OF 5 PLOTS:	B. 45137	33.64	15.59	90.9	5.25	128.05	B. 45137	19.35	55
	***B. 41227**	**30.19**	**15.89**	**90.8**	**4.80**	**117.07**	***B. 41227**	**16.81**	
	B. 46378	30.64	15.12	89.6	4.63	112.93	B. 37161	15.99	
	B. 37161	31.12	14.16	90.2	4.41	107.56	B. 46378	15.77	
	B. 46230	27.15	15.28	87.5	4.15	101.22	B. 46230	15.50	
	B. 46351	24.05	15.48	89.5	3.72	90.73	B. 46351	15.47	
	B. 4764	21.81	15.50	90.3	3.38	82.44	B. 4764	14.44	
	B. 4098	19.83	16.54	91.4	3.28	80.00	B. 46136	14.40	
	B. 46136	20.71	15.63	91.1	3.24	79.02	B. 4098	13.22	
	Mean:				4.10	100.00			
	Significant Difference: 20:1:				.72	17.56			
	Sophia, Field 12 West. Reaped 30.3.55 at 12.50 months. Rainfall:—185.39 inches.								
MEANS OF 5 PLOTS:	***B. 41227**	**33.07**	**15.60**	**91.6**	**5.16**	**121.70**	D. 143/45	17.16	57
	D. 142/45	32.49	15.08	89.8	4.90	115.57	D. 142/45	16.99	
	D. 153/45	35.24	12.91	87.0	4.55	107.31	***B. 41227**	**16.86**	
	D. 157/45	36.10	12.02	87.5	4.34	102.36	D. 127/45	15.90	
	D. 151/45	33.97	12.29	85.9	4.17	98.35	D. 157/45	15.85	
	D. 127/45	29.85	12.99	87.5	3.88	91.51	D. 135/45	15.63	
	D. 135/45	23.42	12.30	85.4	3.77	88.92	D. 151/45	15.45	
	D. 150/45	27.12	11.58	84.3	3.14	74.06	D. 150/45	14.84	
	Mean:				4.24	100.00			
	Significant Difference: 20:1:				.69	16.27			
	Sophia, Field 1 West "B". Reaped 3.8.55 at 11.00 months. Rainfall:—115.63 inches.								
MEANS OF 5 PLOTS:	***B. 41227**	**35.74**	**13.84**	**89.6**	**4.95**	**110.00**	***B. 41227**	**16.62**	58
	B. 47225	31.72	12.77	87.5	4.05	90.00	B. 47225	13.19	
	Mean:				4.50	100.00			
	Significant Difference: 20:1:				.90	20.00			
	Sophia, Field 1 West "A". Reaped 4.8.55 at 11.00 months. Rainfall:—114.48 inches.								
MEANS OF 5 PLOTS:	D. 62/43	44.81	14.12	89.1	6.33	115.72	D. 62/43	20.32	59
	***B. 41227**	**38.34**	**14.31**	**90.3**	**5.49**	**100.37**	***B. 41227**	**16.38**	
	B. 4362	30.23	15.20	91.7	4.59	83.91	B. 4362	15.23	
	Mean:				5.47	100.00			
	Significant Difference: 20:1:				.59	10.79			

***Standard Cane.**

TABLE V. (Contd.)—**Results of Second Ratoon Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Sucrose in Cane per Acre, Tons.
Sophia, Field 3 East "B". Reaped 13.8.55 at 11.25 months. (Standard Estate). Rainfall:—113.38 inches.								
MEANS OF 4 PLOTS:	D. 62/43	53.33	13.52	87.2	7.21	123.24	D. 62/43	20.44
	D. 158/41	50.43	12.06	84.9	6.08	103.93	*B. 41227	18.98
	B. 37161	45.08	13.39	88.4	6.04	103.25	D. 158/41	18.87
	*B. 41227	45.61	13.18	87.4	6.01	102.73	B. 4098	17.64
	D. 142/41	45.08	13.08	85.6	5.90	100.85	B. 37161	17.49
	B. 4098	44.40	13.08	87.0	5.80	99.15	D. 142/41	16.14
	B. 34104	34.70	11.26	83.3	3.90	66.67	B. 34104	13.09
	Mean:				5.85	100.00		
	Significant Difference: 20:1:				.77	13.16		
Sophia, Field 3 East "A". Reaped 15.8.55 at 11.25 months (Cameron-Williams). Rainfall:—113.78 inches.								
MEANS OF 4 PLOTS:	D. 62/43	52.50	13.31	86.9	6.99	128.97	D. 62/43	22.71
	D. 158/41	51.63	10.95	80.8	5.65	104.24	D. 158/41	19.94
	B. 4098	42.26	12.86	87.7	5.43	100.18	B. 4098	19.53
	B. 37161	42.93	12.39	86.9	5.30	97.79	B. 37161	18.61
	*B. 41227	40.73	12.46	85.9	5.07	93.54	D. 142/41	18.41
	D. 142/41	40.66	12.24	84.7	4.97	91.70	*B. 41227	17.16
	B. 34104	36.26	12.49	86.2	4.53	83.58	B. 34104	16.00
	Mean:				5.42	100.00		
	Significant Difference: 20:1:				1.79	33.03		
Sophia, Field 14 West "A". Reaped 20.9.55 at 11.25 months. Rainfall:—117.31 inches.								
MEANS OF 4 PLOTS:	*B. 41227	27.20	15.15	89.1	4.12	116.71	D. 39/46	17.56
	D. 39/46	28.22	13.56	88.5	3.83	108.50	*B. 41227	17.38
	D. 92/46	25.44	15.01	88.6	3.82	108.22	D. 92/46	16.53
	D. 175/46	16.58	14.21	89.7	2.35	66.57	D. 175/46	15.10
	Mean:				3.53	100.00		
	Significant Difference: 20:1:				1.25	35.41		
Sophia, Field 14 West "B". Reaped 20.9.55 at 11.50 months. Rainfall:—117.31 inches.								
MEANS OF 4 PLOTS.	D. 259/46	25.54	14.22	89.7	3.63	117.86	D. 259/46	17.26
	*B. 41227	24.93	14.42	88.7	3.60	116.88	D. 106/46	16.60
	D. 106/46	23.06	15.55	89.1	3.59	116.56	*B. 41227	16.21
	D. 121/46	17.34	13.71	88.2	2.37	76.95	D. 121/46	12.73
	D. 275/46	15.66	14.18	87.0	2.22	72.08	D. 275/46	11.11
	Mean:				3.08	100.00		
	Significant Difference: 20:1:				.40	12.99		

*** Standard Cane.**

TABLE V. (Contd.)—Results of Second Ratoon Variety Trials on Demerara Frontland Clay.

	Variety.	Cane per Acre. Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Sucrose in Cane per Acre. Tons.	Trial No.
	Sophia, Field 15 East "A". Reaped 21.9.55 at 11.00 months. Rainfall :—117.31 inches.								
MEANS OF 4 PLOTS:	D. 141/46	22.77	15.29	89.0	3.48	114.85	D. 141/46	19.16	63
	D. 49/46	24.43	13.58	88.6	3.32	109.57	D. 49/46	16.04	
	B. 37161	22.27	14.68	88.8	3.27	107.92	B. 37161	15.27	
	*B. 41227	20.28	13.62	88.8	2.76	91.09	D. 106/46	14.17	
	D. 91/46	19.56	13.80	86.2	2.70	89.11	*B. 41227	13.87	
	D. 106/46	18.20	14.14	87.1	2.64	87.13	D. 91/46	13.70	
	Mean:				3.03	100.00			
	Significant Difference: 20:1:				.63	20.79			
	Sophia, Field 15 East "B". Reaped 21.9.55 at 11.00 months. Rainfall :—117.31 inches.								
MEANS OF 4 PLOTS:	*B. 41227	27.02	15.12	87.6	4.09	121.36	*B. 41227	16.05	62
	B. 37161	26.74	15.24	89.5	4.07	120.77	B. 37161	14.79	
	D. 183/46	13.33	14.61	89.7	1.94	57.57	D. 183/46	11.03	
	Mean:				3.37	100.00			
	Significant Difference: 20:1:				.73	21.66			
	Sophia, Field 14 East "B". Reaped 28.9.55 at 11.00 months. Rainfall :—118.55 inches.								
MEANS OF 4 PLOTS:	*B. 41227	23.96	13.28	88.4	3.18	100.63	*B. 41227	15.52	64
	B. 37161	21.97	14.36	90.7	3.15	99.68	B. 37161	14.75	
	Mean:				3.18	100.00			
	Significant Difference: 20:1:				—	—			
	Sophia, Field 14 East "A". Reaped 28.9.55 at 11.00 months. Rainfall :—118.55 inches.								
MEANS OF 4 PLOTS:	B. 37161	24.67	14.82	89.3	3.65	121.67	B. 37161	15.80	65
	*B. 41227	20.46	13.09	85.4	2.68	89.33	*B. 41227	15.53	
	D. 133/46	19.79	13.51	86.7	2.67	89.00	D. 133/46	14.26	
	Mean:				3.00	100.00			
	Significant Difference, 20:1:				—	—			

* Standard Cane.

TABLE IV. (Contd.)—**Results of First Ratoon Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Sucrose in Cane per Acre, Tons.	Tri No
	Sophia, Field 11 East "B". Reaped 30.9.55 at 10.75 months. Rainfall :—107.32 inches.								
MEANS OF 4 PLOTS.	D. 62/43	34.90	14.00	85.6	4.88	110.41	D. 62/43	17.83	66
	*B. 41227	31.77	14.78	87.5	4.70	106.33	*B. 41227	17.79	
	B. 48372	25.55	14.40	85.1	3.68	83.26	B. 48372	14.94	
	Mean :				4.42	100.00			
	Significant Difference : 20 : 1:				.69	15.61			
	Sophia, Field 11 East "A". Reaped 5.10.55 at 10.75 months. Rainfall :—109.93 inches.								
MEANS OF 4 PLOTS.	*B. 41227	34.66	14.32	87.7	4.96	102.27	*B. 41227	16.52	67
	D. 62/43	36.92	12.85	84.5	4.74	97.73	D. 62/43	16.42	
	Mean :				4.85	100.00			
	Significant Difference : 20 : 1:				—	—			
	Sophia, Field 9 East "B". Reaped 26.10.55 at 10.75 months. Rainfall :—94.00 inches.								
MEANS OF 4 PLOTS.	D. 62/43	37.75	13.48	84.3	5.09	117.28	*B. 41227	17.33	68
	*B. 41227	36.40	13.85	85.7	5.04	116.13	D. 62/43	17.16	
	B. 4733	33.99	11.51	81.0	3.91	90.09	B. 48372	14.82	
	B. 48372	28.45	11.66	78.1	3.32	76.50	B. 4733	12.93	
	Mean :				4.34	100.00			
	Significant Difference : 20 : 1:				.74	17.05			
	Sophia, Field 9 East "A". Reaped 2.11.55 at 11.00 months. Rainfall :—93.91 inches.								
MEANS OF 4 PLOTS.	*B. 41227	36.43	14.20	89.1	5.17	118.04	D. 62/43	17.68	69
	D. 62/43	38.79	12.82	83.4	4.97	113.47	*B. 41227	17.13	
	B. 4744	25.16	11.87	81.7	2.99	68.26	B. 4744	14.05	
	Mean :				4.38	100.00			
	Significant Difference : 20 : 1:				.69	15.75			

* **Standard Cane.**

TABLE V. (Contd.)—**Results of Second Ratoon Variety Trials on Demerara Frontland Clay.**

	Variety.	Cane. per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
	Pln. L.B.I., Field Brothers 13. Reaped 4.10.55 at 11.75 months. Rainfall:—82.95 inches.								
MEANS OF 5 PLOTS.	*B. 41227	34.82	13.90	88.6	4.84	107.32	*B. 41227	17.54	73
	B. 45151	32.86	14.03	87.5	4.61	102.22	B. 46351	15.23	
	B. 46351	31.47	14.05	87.4	4.22	98.00	B. 45151	14.79	
	B. 37161	30.94	13.56	87.5	4.19	92.90	B. 37161	14.38	
	Mean:				4.51	100.00			
	Significant Difference, 20:1:				.40	8.87			
	Pln. Leonora, Field A.C.S. 45 C.I. Reaped 24.2.55 at 10.75 months. Rainfall:—134.49 inches.								
MEANS OF 4 PLOTS:	*B. 41227	19.79	14.00	88.2	2.77	133.82	*B. 41227	15.60	70
	B. 45151	16.25	14.24	88.3	2.31	111.59	B. 4098	15.27	
	B. 4764	15.91	14.29	89.3	2.27	109.66	B. 4764	14.33	
	B. 4098	16.71	13.25	87.9	2.22	107.25	B. 37161	12.49	
	B. 46230	14.34	14.30	87.6	2.05	99.03	B. 46351	12.18	
	B. 37161	14.70	12.84	87.0	1.89	91.30	B. 46136	11.59	
	B. 46351	12.29	13.50	87.1	1.66	80.19	B. 46230	10.47	
	B. 46136	10.53	12.97	84.2	1.37	66.18	†B. 45151	8.32	
	Mean:				2.07	100.00			
	Significant Difference, 20:1:				.50	24.15			
	Pln. Lusignan, Field 109 A.W. Reaped 2.11.55 at 10.50 months. Rainfall:—83.63 inches.								
MEANS OF 5 PLOTS.	*B. 41227	31.55	13.91	87.2	4.39	118.33	*B. 41227	16.56	72
	B. 37161	32.81	13.28	87.5	4.36	117.52	B. 37161	15.05	
	B. 4744	24.74	12.82	84.6	3.17	85.44	B. 4747	13.76	
	B. 4747	24.49	12.01	79.8	2.94	79.25	B. 4744	13.25	
	Mean:				3.71	100.00			
	Significant Difference: 20:1:				.77	20.75			

*** Standard Cane.**

† Results for Plants and 2nd Ratoons only.

TABLE V. (Contd.)—**Results of Second Ratoon Variety Trials on Berbice Frontland Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Combined results for 3 Crops, Plants, 1st and 2nd Ratoons. Sucrose in Cane per Acre, Tons.	Trial No.
	Pln. Albion, Field N. 15 W.S. Reaped 1.12.55 at 11.75 months. Rainfall :—90.63 inches.								
MEANS OF 5 PLOTS:	*B. 41227	48.30	15.24	87.9	7.36	102.22	*B. 41227	22.38	77
	B. 4744	52.84	13.88	85.0	7.33	101.80	B. 4744	22.26	
	B. 47419	48.56	15.03	86.5	7.30	101.39	B. 37161	21.23	
	B. 37161	45.34	15.04	87.9	6.82	94.72	†B. 47419	15.26	
	Mean :				7.20	100.00			
	Significant Difference : 20 : 1 :				—	—			
	Pln. Port Mourant, Field R.O.G. 9. Reaped 14.4.55 at 10.75 months. Rainfall :—78.34 inches.								
MEANS OF 4 PLOTS.	B. 37161	36.29	15.80	90.2	5.73	113.02	B. 37161	16.17	74
	B. 46378	36.69	14.35	86.8	5.26	103.75	*B. 41227	15.81	
	B. 45137	34.26	15.16	89.5	5.19	102.37	B. 45137	15.38	
	B. 4747	32.20	14.33	87.5	4.61	90.93	B. 46378	15.15	
	***B. 41227**	**30.39**	**14.96**	**89.5**	**4.55**	**89.74**	B. 4747	14.10	
	Mean :				5.07	100.00			
	Significant Difference, 20 : 1 :				—	—			
	Pln. Rose Hall, Field 37 S. Reaped 20.4.55 at 12.75 months. Rainfall :—122.81 inches.								
MEANS OF 4 PLOTS.	*B. 41227	42.32	13.64	81.1	5.77	125.71	*B. 41227	17.41	75
	B. 46378	40.31	12.85	80.8	5.18	112.85	B. 46378	15.20	
	B. 4747	39.30	12.14	77.8	4.77	103.92	B. 37161	14.64	
	B. 37161	34.87	13.52	81.2	4.71	102.61	B. 46103	14.59	
	B. 46308	33.74	13.35	78.1	4.50	98.04	B. 46308	14.53	
	B. 46103	32.26	13.52	80.3	4.36	94.99	B. 4747	14.49	
	B. 46218	31.15	12.47	77.4	3.82	83.22	B. 46218	12.84	
	B. 46384	28.49	12.70	77.3	3.62	78.87	B. 46384	11.84	
	Mean :				4.59	100.00			
	Significant Difference, 20 : 1 :				1.26	27.45			
	Pln. Rose Hall, Field Prospect 2. Reaped 31.8.55 at 10.50 months. Rainfall :—81.09 inches.								
MEANS OF 5 PLOTS.	B. 4098	36.66	14.31	89.0	5.25	115.39	B. 47258	17.99	76
	B. 47258	32.89	14.54	90.4	4.78	105.06	B. 4098	16.79	
	*B. 41227	32.40	14.07	90.1	4.56	100.23	B. 4764	15.94	
	B. 4764	33.12	13.38	87.3	4.43	97.37	*B. 41227	15.39	
	B. 47379	32.29	11.62	84.8	3.75	82.42	B. 47379	14.00	
	Mean :				4.55	100.00			
	Significant Difference, 20 : 1 :				.78	17.14			

*** Standard Cane.**
† Not reaped at 1st Ratoons.

TABLE V. (Contd.)—**Results of Second Ratoon Variety Trials on Riverside Clay.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Purity.	Sucrose in Cane per Acre.		Combined results for 3 Crops, Plants, 1st and 2nd Ratoons.		Trial No.
					Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.	
	Pln. Farm, Field 61 Prospect. Reaped 5.9.55 at 11.00 months. Rainfall:—96.51 inches.								
MEANS OF 5 PLOTS.	*B. 41227	33.52	13.68	89.2	4.59	110.60	*B. 41227	16.44	78
	B. 4747	33.14	12.51	84.8	4.15	100.00	B. 4747	15.42	
	B. 37161	28.61	13.92	90.9	3.98	95.90	B. 4744	15.42	
	B. 4744	31.42	12.40	87.0	3.89	93.73	B. 37161	13.43	
	Mean:				4.15	100.00			
	Significant Difference: 20:1:				—	—			
	†*Pln. Schoon Ord, Field G.F. "J". Reaped 20.10.55 at 12.25 months. Rainfall:—106.57 inches.*								
MEANS OF 5 PLOTS.	*B. 41227	24.92	14.16	86.7	3.53	146.47	*B. 41227	10.90	101
	B. 46378	19.43	13.80	87.4	2.68	111.20	B. 46378	8.44	
	B. 46290	20.15	13.32	86.7	2.68	111.20	B. 46340	7.85	
	B. 4098	13.98	14.66	89.1	2.05	85.06	B. 4098	7.81	
	B. 46351	13.77	13.74	86.0	1.89	78.42	B. 46290	7.49	
	B. 46340	12.09	13.50	87.1	1.63	67.33	B. 46351	7.46	
	Mean:				2.41	100.00			
	Significant Difference: 20:1:				.94	3.90			

* **Standard Cane.**

† **1st Ratoons Reaped by Estate.**

E. VARIETY PERFORMANCE SUMMARY.

Varieties under test in 1955 are discussed under the following captions :—

1. Standard Canes.
2. Barbados and Demerara Seedlings produced prior to the 1944 Series.
3. Barbados and Demerara Seedlings of the 1944, 1945 and 1946 Series.
4. Barbados Seedlings of the 1947 and 1948 Series.
5. Barbados Seedlings of the 1949 Series.
6. Barbados 1950 and 1951 Seedlings.
7. Demerara 1952 Seedlings.
8. Other Varieties.

1. Standard Canes.

B.37161, (B.3365 x B.603).

Trial Nos. : 51, 52, 53, 54, 55; 62, 63, 64, 65, 72, 73, 74, 75, 77, 78, 83; 98, 102, 103, 126, 128.

B.37161. B.37161 is best suited to the intermediate pegassy clays but it also gives good yields on clays although in experiments these yields are below those of B.41227. It does not ratoon as well as B.41227.

B.37161 is generally a light-arrowing variety which does well over a wide range of rainfall. It tolerates dry conditions better than B.41227 and most of the other commercially grown varieties in British Guiana. However, when nearing maturity it is very sensitive to rainfall and heavy showers produce a marked decrease in Pol. % Cane, particularly where arrowing has occurred. B.37161 is rated as Susceptible/Tolerant to Leaf Scald and shows little infection by Chlorotic Streak. It is however, fairly heavily attacked by borer in some areas.

B.37161 possesses a juice of average quality, light in colour, and one which clarifies readily when phosphate is not deficient.

B.41227, (B.35207 x P.O.J. 2878).

B.41227 is a good general purpose variety which ratoons strongly. It is best suited to clays and the more clayey intermediate pegassy soils but has actually out-yielded B.37161 on pegasse where drainage is good and the rainfall has been heavy.

B.41227 requires good drainage and a moderate rainfall. It does not tolerate water-logging, and the individual canes tend to become thin where tilth is poor and the nitrogen supply below optimum. This variety possesses a juice of average quality but one which is generally darker in colour than that of most other varieties and occasionally gives some trouble to clarify where the phosphate content of the juice is low. Under normal climatic conditions in British Guiana, B.41227 rarely arrows. It is not an early maturing variety and considerable loss of sugar may result if it is reaped too early. In general, B.41227 appears to be best reaped at 13½ to 14 months as plants and not under 12 months as ratoons. It is rated as Susceptible/Tolerant to Leaf Scald disease but does not appear to be susceptible to Chlorotic Streak to any appreciable degree.

On the basis of the experiments reaped by the experiment station, B.41227 still appears to be the best all-round commercial variety, although B.37161 and a couple of the newer varieties are shewing promise of being strong rivals.

Comparison of the Standards B.41227 and B.37161. The following table affords a comparison of the results from all trials reaped to date in which these standard canes have both been included.

Soil Type.	Variety.	Tons Available Pol. per Acre.			Mean Pol. % Cane.
		Plants.	1 R.	2 R.	
Clays	B. 41227	6.51 (23)	5.01 (23)	4.31 (21)	12.96 (67)
,,	B. 37161	5.82 (23)	4.87 (23)	4.04 (21)	12.79 (67)
Pegassy Clays	B. 41227	5.22 (7)	5.00 (6)	3.16 (1)	12.41 (14)
	B. 37161	4.98 (7)	4.78 (6)	3.19 (1)	12.91 (14)
All Experiments	B. 41227	6.21 (30)	5.01 (29)	4.26 (22)	12.87 (81)
,, ,,	B. 37161	5.63 (30)	4.85 (29)	4.01 (22)	12.81 (81)

The figures in parentheses denote the number of trials.

2. Barbados and Demerara Seedlings produced prior to the 1944 Series.

B.4098, (B.3439 x Co. 290).

Trial Nos. 51, 53, 54, 55, 70, 76, 101.

B.4098. B.4098 has been well tested against B.41227 and in spite of its popularity for some areas it is definitely inferior to this standard in respect to yield of sugar per acre, although slightly better in Pol. % Cane.

B.4098 requires a heavy rainfall for best results and does not stand up well to dry conditions. It is for this reason also unsuited to the more porous pegassy clays.

Ratoon yields are frequently disappointing and the possibility of this being due to Ratoon-Stunting disease is being investigated. B.4098 is Resistant to Leaf Scald disease but is frequently heavily attacked by borers.

B.4362, (B.37161 x P.O.J. 2878).

Trial Nos. 51, 59, 92, 99, 110, 116, 117, 120, 123, 127, 129.

B.4362. This early-ripening variety is best suited to intermediate pegassy clays and well-drained riverside soils. In general, it does not ratoon as satisfactorily as the two standard varieties although in fertile, well-drained soils, good ratoon yields have been obtained.

In general, B.4362 is inferior to B.41227 in yield of sugar per acre. It has been suggested that Ratoon-stunting disease may be responsible for the relatively poor ratoon yields which are often a feature of this variety and this is being investigated. B.4362 is one of the best *quality* canes grown in British Guiana, possessing a high pol. content and a juice of relatively high purity that clarifies well where phosphate is not deficient. It appears best suited to a moderately heavy rainfall.

B.4362 is rated as Tolerant to Leaf Scald disease. It is however, infected with Chlorotic Streak moderately heavily and often suffers severely from borer attacks.

B.4373, (B.3354 x Co. 290).

Trial Nos. : 51, 110, 126, 127, 128, 131.

B.4373 is one of the few varieties under test which is Resistant to Leaf Scald disease. It is however, inferior in yielding ability to the two standard varieties, particularly in its ratooning capacity. B.4373 is slightly inferior to B.41227 in Pol. % Cane and Juice Purity and is moderately susceptible to Chlorotic Streak disease.

B.43214, (B.3353 x Co. 290).

Trial Nos. : 110, 113, 115, 116, 117.

B.43214. On the basis of its performance against B.34104 in the past it was decided to compare this variety against B.41227. In eight reapings as plants, B.43214 has only once exceeded the yield of the standard. It tends to improve relative to the standard on ratooning however, and the variety will continue to be further tested.

B.43253, (B.3439 x B.37175).

Trial Nos. : 109, 122, 128, 129, 130.

B.43253. This variety possesses the highest Pol. % Cane of any of the cane varieties which appear to have any commercial value in British Guiana. It is however, inferior in yield to the two standard varieties and can only be recommended for planting where an ample supply of land but a factory of low capacity. It appears equally suited to clays and pegassy clays.

B.43253 is Resistant to Leaf Scald disease.

B.43413, (M.D.47 x Co. 290).

Trial Nos. : 92, 126, 131.

B.43413. Although not a very attractive looking cane, being of smaller than average diameter, this variety has been a very consistent performer against B.41227. In ten reapings as plants it has outyielded the standard on five occasions (once significantly). In nine reapings as first ratoons the standard has been outyielded in five, twice significantly, while in eight reapings as second ratoons the standard has also been outyielded on five occasions, twice significantly. It has itself been significantly outyielded by the standard on one occasion as plants, and on three as first and second ratoons.

It is particularly worthy of notice that it is in tests on the more difficult (low-yielding) areas that it has shewn to best advantage.

In general, B.43413 has shewn itself to be about the equal of B.41227 in yield of sugar per acre and in cane quality and is again recommended for moderate trial on the commercial scale.

B.43413 is rated as Tolerant to Leaf Scald disease.

D.158/41, (Co. 421 x D.166/34).

Trial Nos. : 53, 54, 93, 97, 99, 100, 102, 129.

D.158/41. This variety continues to give satisfactory yields in trials. Although somewhat below B.41227 in *average* yield, it is equal to this standard in *Autumn* reapings on clays. Its performance on pegassy clays and in Spring reapings is erratic.

D.158/41 is a moderately good ratooning variety which appears best suited to a moderate to heavy rainfall. It arrows heavily in the Autumn but even where arrowing is followed by rain it maintains its quality more satisfactorily than do the other *arrowing* varieties at present in tests and in commercial cultivation.

D.4/43, (D.200/36 x Diamond 10).

Trial Nos. : 84, 85, 97, 100, 102, 111.

D.4/43. D.4/43 grows vigorously and it is intended to continue to test it on the sugar estates. A heavy arrowing variety, it has shown itself to be a variety which is unsuited for reaping in the Spring crop. When reaped in the Autumn however, it appears likely to be comparable with the standard and it is being tested further for this to be determined.

D.4/43 is Tolerant to Leaf Scald disease.

D.54/43, (Co. 421 x D.166/34).

Trial Nos. : 84, 92, 96, 97, 100, 102, 103, 129.

D.54/43. This variety is very unsuitable as a Spring cane owing to the rapidity with which it resumes growth if heavy rain follows its arrowing. In consequence, future interest in the testing of this variety will be confined mainly to experiments for Autumn reaping.

D.62/43, (Co. 421 x Co. 331).

Trial Nos. : 51, 53, 54, 59, 66, 67, 68, 69, 95.

D.62/43. The testing of this variety (which has now been completed), has shewn it to be an Autumn cane and a high yielder on clays. Under these conditions, it surpassed the standards in tons sugar per acre while equal to them in cane quality. Its high Susceptibility to Leaf Scald disease precludes its being recommended as a commercial cane in British Guiana.

3. Barbados and Demerara Seedlings of the 1944, 1945 and 1946 Series.

B.45137, (B.38272 x B.34104).

Trial Nos. : 55, 74, 92, 99, 110, 120, 127, 129.

B.45137. B.45137 continues to perform consistently in trials, such consistency having extended over the period 1952—1955. As plants, B.45137 yields on average somewhat less than B.41227 but this deficiency is more than

made good by the higher yield as ratoons. Its juice quality as plants is also below that of the standard but is equal to that of the standard as ratoons.

B.45137 is not an attractive looking cane, its stems being of slightly smaller diameter than average for British Guiana but the stools are vigorous and possess many canes. It has performed well on all soil types and it appears to be a hardy cane under a wide range of conditions.

B.45137 is Tolerant to Leaf Scald disease but suffers from a leaf spot which however does not appear to be of any economic importance. This variety consistently outyields the standard as ratoons and is one of the strongest ratooning varieties under test at present. It is again recommended for moderate extension on the estates.

D.37/45, (B.34104 x Co. 331).

Trial Nos. : 92, 96, 99, 102, 116, 117, 122, 127; 129.

D.37/45. This variety arrows heavily and is essentially an Autumn cane, its average performance in tests reaped during the second half of the year being better than that of B.41227 and B.37161. This is clearly shewn in the following table in which its yields of available pol. per acre relative to B.41227 for Spring and Autumn reapings are compared. If reaped during the months of September, October and November at twelve to thirteen months age, D.37/45 usually gives outstanding yields.

Yield Index.

Cycle.	Spring.	Autumn.
Plants	..... 78 (7)	105 (9)
1st Ratoons	..... 86 (2)	114 (7)
2nd „	..... 73 (1)	121 (6)

D.37/45 ratoons strongly and appears to do best on clays and with a moderately heavy rainfall. It does not appear to be particularly suited to pegassy clays although it must be admitted that in the trials on these soils it was reaped in the Spring.

D.37/45 possesses a juice of good quality, and has a slightly higher Pol. % Cane than B.41227. It is rated as being Susceptible to Leaf Scald disease, and is also susceptible to Chlorotic Streak.

B.46351, (B.35206 x P.O.J. 2878).

Trial No. : 55, 70, 73, 94, 95, 101, 110, 123, 130.

B.46351. The testing of this variety is now well advanced. B.46351 is an irregular performer which appears to best advantage with a moderate rainfall. This variety seems very sensitive to soil conditions, equalling or bettering B.41227 on good soils but falling well below the standard where more difficult soil conditions are encountered.

B.46351 is Tolerant to Leaf Scald disease.

D.39/46, D.49/46, D.133/46, D.141/46 and **D.184/46** are being tested in trials on the sugar estates. **D.49/46**, yields heavy crops of cane but its juice is of lower quality than that of B.41227.

4. Barbados Seedlings of the 1947 and 1948 Series.

B.4744, (Co. 421 x B.4098).

Trial Nos. : 69, 72, 77, 78, 92, 95, 116, 117, 122, 127, 129.

B.4744. In view of the performance of this variety in Barbados, its performance in British Guiana has been very disappointing. Pol. % Cane and Juice Purity are frequently very poor and the yield of sugar per acre is less than that of B.41227.

B.4744 is rated as being Susceptible/Tolerant to Leaf Scald disease.

B.47225, (B.37161 x P.O.J. 2878).

Trial Nos. : 58, 85, 94, 96, 99, 100, 102, 103, 117, 120, 127, 130.

B.47225 is an early ripening variety which does best on pegasse and intermediate pegassy clays. To date, it has been reaped on thirteen occasions as plants, on nine as first ratoons and on one as second ratoons.

In the thirteen reapings as plants, B.47225 has outyielded B.41227 on four occasions, three of these being on pegassy clays. It has itself been outyielded by the standard on eight occasions, six being by significant amounts. In nine reapings as first ratoons, B.47225 has outyielded the standard only once. In the single reaping as second ratoons, B.47225 has been outyielded by the standard significantly, this trial being on a frontland clay soil.

From the evidence obtained to date, B.47225 appears best suited to pegasse and intermediate pegassy clays on which soil type it gives somewhat higher yields than B.41227 as *plants*. On clays however, B.41227 is superior to B.47225, often by a wide margin. In the trials reaped to date, B.47225 appears to be inferior to B.41227 as a ratooner on any soil type. Further confirmation of this at the second ratoon stage is required however.

B.47225 possesses a Pol. % Cane and Juice Purity about equal to that of B.41227 and is rated as being Resistant to Leaf Scald disease.

B.47258, (B.39254 x B.34104).

Trial Nos. : 76, 92, 99, 123, 127, 128, 130, 131.

B.47258. In trials reaped to the present, this variety has maintained its early promise. In eleven trials as plants it has outyielded B.41227 in eight,

three of these being by significant amounts. In six reapings as first ratoons, B.41227 has been outyielded in four, one being by a significant margin while in three reapings as second ratoons, the standard has been beaten once.

B.47258 is an attractive cane which has done well both on clay and intermediate pegasse soils and shews promise of ratooning satisfactorily. In consequence, this variety is recommended for moderate extension on the commercial scale. It has the additional advantage of possessing a Pol. % Cane and Juice Purity above average and is rated as being Tolerant to Leaf Scald disease.

B.47379, (B.37161 x B.4098).

Trial Nos. : 76, 93, 126, 128, 131.

B.47379. This variety has given yields in trials as plants that are comparable with those of B.41227. In four reapings as first ratoons however, the yield relative to B.41227 has fallen appreciably. Its testing will be continued however.

B.47419, (P.O.J. 2878 x B.34104),

Trial Nos. : 77, 94, 97.

B.47419. This variety, is Susceptible to Leaf Scald disease and its testing therefore was not pursued. As it is being considered for extension on a commercial scale on the East Bank, Demerara estates, the following summary of its performance in trials to date will be of interest.

As plants, B.47419 has been reaped on nine occasions, only beating the standard once and being itself significantly beaten on four of the eight occasions it was surpassed by B.41227. In seven reapings as first ratoons it has again beaten the standard only once, while in the single second ratoons reaping it was equal to the standard. In tests reaped to date therefore B.47419 does not appear to be the equal of B.41227. It is also inferior to B.41227 in Pol. % Cane and in Juice Purity.

B.4711, B.47162 and **B.47399** are being further tested against B.41227.

No Barbados seedlings of the 1948 series are now under test.

5. Barbados Seedlings of the 1949 Series.

The most promising seedlings of the Barbados 1949 series, are **B.4942, B.4995, B.49257, B.49353** and **B.49354**. In addition, **B.49119** which was forwarded with the Barbados 1950 series of seedlings is to be widely tested in view of its good performance as a ratooner in trials in Barbados and on the basis of the plant cane trial at Sophia reaped during 1955. The other seedlings of this series are also under test and two of these—**B.49122** and **B.49186**—are to be further tried on pegasse.

6. Barbados 1950 and 1951 Seedlings.

Three sorting trials (Nos. 104, 107 and 112) of the **Barbados 1950 series** were reaped in 1955. From these results thirteen seedlings have been selected for further trial.

The sorting trials of the **Barbados 1951 series** are scheduled for reaping in 1956.

7. Demerara 1952 Seedlings.

The sorting trials (Nos. 105, 106 and 115) of the **Demerara 1952 series** were reaped in 1955 and selections for further trials will be made after the first ratoon yields from these trials have been obtained.

8. Varieties of Other Countries.

During 1955, trials were reaped containing the Mauritius seedlings **M.134/32, M.213/40** and **M.423/41**; the Javan varieties **P.O.J. 2967** and **P.O.J. 3016**, and the Australian variety **Pindar.** Of these varieties, only Pindar shews any promise under local conditions.

The Javan and Mauritius varieties fell far short of the standard (B.41227) in yield, while their juice quality was generally very poor.

F. GENERAL SUMMARY AND RECOMMENDATIONS.

The 1955 cane variety trials have confirmed the previous observations regarding B.45137 and B.43413. These two varieties have yielded well on clays, on which soil type the former variety has been especially outstanding as a strong ratooner. Unfortunately, neither are attractive canes being of smaller than average diameter and also of slightly lower Pol. % Cane than B.41227. They are, however, hardy canes and B.45137 in particular is worthy of trial on a small scale on estates.

B.47258 continues to perform well against B.41227 although it has not yet been reaped in a sufficient number of experiments as second ratoons to be sure of its ratooning ability. It has performed sufficiently well on clays however, to justify its being tried by estates on this soil type. Of considerable importance is the fact that this variety possesses a higher than average Pol. content in spite of the tendency for the upper stalk buds to grow when approaching maturity.

B.37161 remains probably the best all-round variety for the heavier pegassy clay soils. Apart from Co.419 on some areas, no other variety has as yet shewn itself to be the equal of B.37161 on this soil type. B.47225 which gives good yields as plants does not appear to ratoon satisfactorily.

The trials in which the major commercial canes of Java and Mauritius were included i.e. P.O.J. 2967 and 3016 and M.134/32, M.213/40 and M.423/41, have shewn these varieties to be considerably inferior to the standards. It is possible however, that the breding lines of certain countries may produce varieties suited to the conditions that prevail in British Guiana and trials with major commercial varieties from other countries will continue to be placed in trials from time to time as they become available.

In experiments on the growth and ripening characteristics of certain varieties which are described in another paper in this Bulletin, it has been shewn that B.41227 is a late-maturing variety and that considerable loss of sugar may be sustained if this variety is reaped early. In consequence, estates managements are advised not to plant this variety in blocks of fields in which early maturing varieties are also planted as maximum yields cannot then be obtained if the fields of the block are to be reaped at approximately the same time. There is little doubt that yields from this variety have suffered considerably by reaping at too early an age in many instances.

The performance of the more promising and outstanding varieties under test are compared with B.41227 in Table VI. The comparisons are on the basis of yields of available pol. per acre relative to B.41227 which is rated as 100. Pol. % Cane ratings are compared similarly.

On the basis of the results obtained from the trials and from observations of the estates cultivations, the following general recommendations are made.

TABLE VI.—The more Outstanding Varieties Compared with B. 41227.

Variety.	No. of Comparisons.			Available Pol. Per Acre Index. (B. 41227 = 100).			Tons Avail. Pol. per Acre. (B. 41227 = 100).			Pol. % Cane Index. (B. 41227 = 100). Mean All Cycles.
	P.	1 R.	2 R.	P.	1 R.	2 R.	P.	1 R.	2 R.	
D. 62/43	16	16	15	108	109	103	6.91	5.58	4.84	101
B. 45137	12	8	5	95	112	113	6.08	5.73	5.31	99
B. 47258	11	6	3	104	110	99	6.65	5.63	4.65	104
D. 37/45	16	11	7	92	108	114	5.89	5.53	5.36	100
B. 43413	10	9	8	102	98	104	6.53	5.02	4.89	99
B. 41227	—	—	—	**100**	**100**	**100**	**6.40**	**5.12**	**4.70**	100
D. 158/41	10	9	4	96	91	107	6.14	4.66	5.03	96
D. 54/43	10	9	2	88	94	121	5.63	4.81	5.26	91
D. 4/43	11	9	5	94	93	101	6.02	4.76	4.75	97
B. 37161	30	29	22	91	97	94	5.82	4.97	4.42	100
B. 46378	18	17	16	94	90	96	6.02	4.61	4.51	97
B. 47419	9	7	1	89	93	97	5.70	4.76	4.56	97
B. 47225	13	9	1	96	90	86	6.14	4.61	4.04	100
B. 4362	13	6	4	94	91	86	6.02	4.66	4.04	108
B. 4098	13	13	13	93	94	84	5.95	4.81	3.95	102
B. 46351	14	10	9	89	93	87	5.70	4.76	4.09	98
B. 43253	8	3	3	90	90	87	5.76	4.61	4.09	109
B. 4373	14	9	9	89	90	88	5.70	4.61	4.14	98
B. 4744	13	8	4	91	93	77	5.82	4.76	3.62	96
B. 34104	21	19	16	84	81	83	5.38	4.15	3.90	99

Cane Variety.	SOIL TYPE.			
	Berbice Frontland Clay.	Demerara Frontland Clay.	Riverside Clays.	Pegasse.
B. 41227	55	55	50	45
B. 37161	35	35	35	50
B. 45137, B. 47258, B. 43413, B. 46378, B. 4098	10	10	15	5

The figures given refer to the percentage of the area in the particular soil type recommended to be planted in the respective varieties.

These recommendations may be modified in accordance with the results from trials to be reaped in the future. Where conditions on certain estates appear to favour a particular variety more than another the management will necessarily be guided by local experience.

CULTIVATION EXPERIMENTS.

BY

L. S. BIRKETT and C. CAMERON.

The cultivation experiment designed to compare the standard estate system of hand cultivation with the Cameron-Williams system of cultivation, was reaped as second ratoons during 1955. The data obtained to date are summarised in Table I.

The main points to be noted are :

(i). With the exception of the variety B.41227, the yields from the Cameron-Williams System of cultivation are significantly higher than those obtained from the standard estate system of hand cultivation in the plant cane cycle, but are not significantly higher in the case of the first ratoons while at the second ratoons cycle the yield falls below that of the standard estate system.

(ii). The quality of the cane grown under the standard estate system of cultivation is consistently better than that grown under the Cameron-Williams system. Over the three cycles this difference in the quality of the cane is significant at the .05 level of significance.

(iii). The soil and ecological factors which are functions of the system of cultivation, exert certain general effects which, however, vary in their magnitude from variety to variety.

Apart from the foregoing general conclusions, there are certain specific points that call for comment.

The main reason for the improved yields obtained from the Cameron-Williams system of cultivation in the plant cane and first ratoon cycle is considered to be due to the improved drainage which has resulted from having a 10 ft. wide cane bed as against one of 36 ft. (that of the standard estate system). This would be of particular importance in the very wet years (1953-1955) over which the experiment extended. However, it is likely that such benefits will obtain even in more normal years since the average annual rainfall in British Guiana is high. The question naturally arises as to why this benefit did not extend to the second ratoons as well.

Reference to the details of the Cameron-Williams system of cultivation[1] will show that the system requires the digging of a deep drill in alternate fork mould gutters for moulding the ratoons. This drill is normally sunk to two feet over three ratoon cycles. At Sophia however, where the land must be turned over more frequently and therefore cannot be run to third ratoons,

TABLE I.

CULTIVATION EXPERIMENT.

System.					Cameron—Williams System.									
Purity.		Tons Cane per Ton 96° Sugar.			Tons 96° Sugar per Acre.				Juice Purity.			Tons Cane per Ton 96° Sugar.		
R.	2 R.	Plants.	1 R.	2 R.	Plants.	1 R.	2 R.	Total.	Plants.	1 R.	2 R.	Plants.	1 R.	2 R.
7.5	87.2	8.59	7.99	8.14	7.38	6.77	6.33	20.48	84.4	87.2	86.9	9.11	7.91	8.29
4.6	87.4	9.13	8.84	8.34	6.02	4.69	4.57	15.28	82.1	84.7	85.9	10.16	9.51	8 91
6.7	84.9	9.03	8.34	9.26	7.22	5.39	4.93	17.54	80.5	86.0	80.8	10.43	9.50	10.48
8.3	87.0	9.31	8.06	8.43	7.13	5.51	4.95	17.59	83.3	87.4	87.7	9.53	8.14	8.54
9.6	88.4	8.70	8.21	8.17	6.72	5.15	4.82	16.69	83.2	85.5	86.9	9.94	9.22	8.90
6.6	85.6	9.06	8.52	8.50	6.98	5.04	4.45	16.47	83.9	85.9	84.7	9.19	8.04	9.13
6.8	83.3	11.53	9.18	10.02	5.67	4.56	4.09	14.32	83.5	85.2	86.2	9.66	9.47	8.87
7.2	86.3	9.34	8.45	8.69	6.73	5.30	4.88	16.91	83.0	86.0	85.6	9.72	8.83	9.02

Cane Variety.	Standard Estate					
	Tons 96° Sugar per Acre.				Juice	
	Plants.	1 R.	2 R.	Total.	Plants.	1
D. 62/43	6.71	5.23	6.55	18.49	85.1	8
B. 41927	6.25	5.36	5.47	17.08	85.0	8
D. 158/41	6.22	5.31	5.45	16.98	85.2	8
B. 4098	5.13	5.58	5.27	15.98	85.1	8
B. 37161	5.53	4.93	5.52	15.98	87.0	8
D. 142/41	4.68	4.53	5.30	14.51	84.5	8
B. 34104	4.73	3.40	3.46	11.59	80.3	8
Means.	5.61	4.91	5.29	15.80	84.6	8

the drill is sunk to its full depth at the commencement of the second ratoon stage. This necessitates moulding the second ratoons with saline sub-soil from the second foot of soil instead of that from only six inches as would be the case if a third ratoon cycle was allowed. It is believed that it is the increase in the salinity of the top soil resulting from this operation which is responsible for the reduced yields at the first ratoon stage, and for the actual decrease below that of the standard estate system in the second ratoons. The lower Purity of the juices and of Pol. % Cane reaped from the areas of the Cameron-Williams system of cultivation, is also to be attributed to a higher absorbtion of salts.

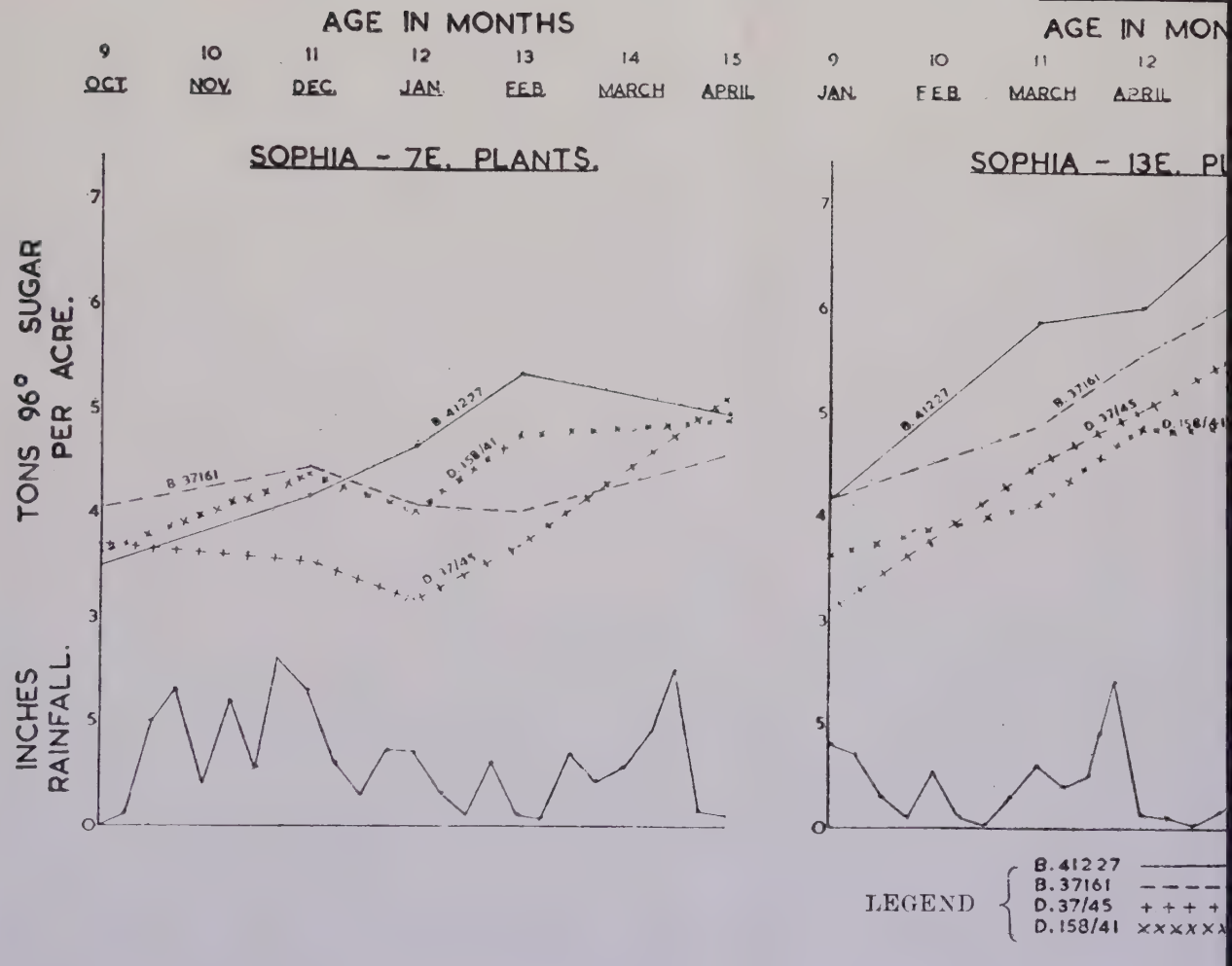
In this experiment, the total yields over the complete cycle of Plants, First and Second ratoons, for all varieties, is 7% higher for the Cameron-Williams system of cultivation. This difference is not statistically significant however.

One of the objects of the Cameron-Williams system of cultivation is to bring saline sub-soil to the surface over a period of years, thereby allowing excess salts to be leached out and removed in the flooding and drainage water. It is hoped that this operation will in time give a soil approximately two feet deep free from excess of salts, in addition to giving a soil of improved texture to a depth of two feet, in which event with the passage of time, the difference in favour of the Cameron-Williams system of cultivation should be more marked.

REFERENCES.

1. C. Cameron and C. H. B. Williams. "The Cameron-Williams System for Cane Cultivation in British Guiana." Sugar Bulletin No. 11, 1942, p.p. 54-57.

FIGURE


AGE IN MONTHS
9 OCT.
10 NOV.
11 DEC.
12 JAN.
13 FEB.
14 MARCH
15 APRIL
SOPHIA - 7E. PLANTS.
TONS 96° SUGAR PER ACRE.
INCHES RAINFALL.
B.41227
B.37161
D.158/41
D.37/45
AGE IN MON
9 JAN.
10 FEB.
11 MARCH
12 APRIL
SOPHIA - 13E. PL
LEGEND
B.41227
B.37161
D.37/45
D.158/41

I

THS

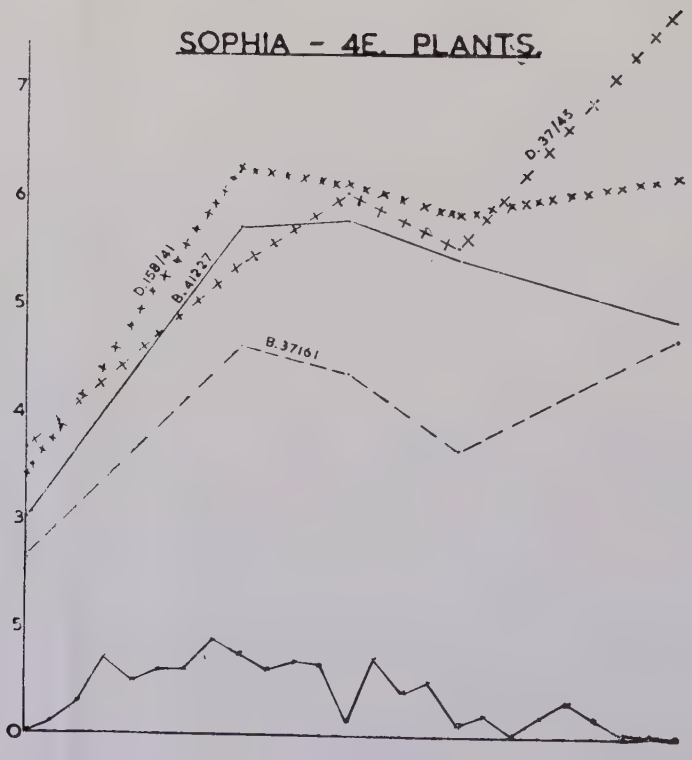
AGE IN MONTHS

13 14 15 9 10 11 12 13 14 15

MAY JUNE JULY APRIL MAY JUNE JULY AUG. SEPT. OCT.

ANTS.

SOPHIA - 4E. PLANTS.



GROWTH AND RIPENING STUDIES OF THE CANE VARIETIES B.41227, B.37161, D.158/41 AND D.37/45.

I. PLANT CANE CYCLE.

BY

L. S. BIRKETT, C. CAMERON and H. GOMES.

Prior to 1930, the area under sugar cane in British Guiana consisted almost entirely of a single variety, the D.625. Between, 1930 and 1935, this variety was rapidly displaced by the varieties Diamond 10 and P.O.J. 2878, which in turn gave way betweeen 1946 and 1952 to Co. 421, D.14/34 and more particularly, to B.34104. From 1952 onwards, the number of varieties in cultivation on the sugar estates has increased very considerably and coincident therewith the range of variability of growth and ripening characteristics of the varieties in cultivation.

In the previous Bulletin (No. 23, page 37), attention was drawn to the necessity of more closely determining the growth and ripening characteristics of the various major and more promising varieties which are now available. Since in British Guiana the planting and harvesting of cane is continued throughout the greater part of the year, the cycle of climatic conditions (more particularly in respect to rainfall) conforms to a less constant pattern than where, as in most other sugar cane-growing countries, planting and harvesting are limited to a definite five to six month period of the year.

As a first approach to the problem, four characteristic variety *types* were selected for investigation and the dates of planting and reaping were so arranged as to cover the varying cycle of rainfall and other climatic conditions over the year more or less fully.

The varieties selected were B.41227, a non-arrowing, late-maturing variety; B.37161, which is light-arrowing and generally regarded as early-maturing; D.158/41 and D.37/45, both heavy arrowing varieties but differing in uniformity in arrowing.

The data for the plant cane results are presented in Tables I, II and III while for more easily following the trends the main data are also presented graphically in Figure I.

DISCUSSION OF RESULTS.

1. SOPHIA 7 E.

Date of planting 13.1.54. Reaping dates: 15.10.54 (9 months); 13.2.54 (11 months); 15.1.55 (12 months); 12.2.55 (13 months) and 13.4.55 (15 months).

TABLE I.
SOPHIA 7 E (Plants).

Age in Months.	Tone 96° Sugar per Acre.				Pol. % Cane.			
	B. 41227.	B. 37161.	D. 37/45.	D. 158/41.	B. 41227.	B. 37161.	D. 37/45.	D. 158/41.
9 Months —	3.50	4.06	3.72	3.63	13.09	14.73	14.05	13.45
11 „ —	4.13	4.45	3.55	4.38	14.27	14.15	13.18	14.06
12 „ —	4.63	4.10	3.18	4.05	14.88	14.29	11.34	14.13
13 „ —	5.35	4.04	3.70	4.76	15.50	13.72	12.40	14.76
15 „ —	4.98	4.59	5.11	4.92	15.19	13.77	14.40	14.67

B.41227. In spite of the heavy "end-of-the-year" rainfall, B.41227 ripened rapidly, attaining its highest yield around thirteen months age. The Pol. % Cane and Juice Purity followed the yield curve.

B.37161. This variety gave a higher yield of sugar per acre than B.41227 at nine to eleven months age but not at greater ages. The November-December rainfall resulted in a decrease in the yield at twelve months age which was still further accentuated at thirteen months. However, the yield again increased at fifteen months age to approximately the same level as at eleven months.

The "arrowed" canes deteriorated rapidly between twelve and thirteen months age *i.e.* following the onset of heavy rains.

D.158/41. This variety increased its yields slowly from nine to eleven months. The November–December rains caused a slight fall in yield at twelve months age but thereafter yields again increased up to fifteen months age. It should be noted that this variety arrowed uniformly and very heavily in the Autumn. Analyses of arrowed and non-arrowed canes at the various reaping dates shewed that up to the middle of December the arrowed canes possessed a higher Pol. % Cane and Juice Purity than the non-arrowed. Thereafter, the reverse was the case.

D.37/45. In this experiment, D.37/45 which had arrowed heavily in the Autumn shewed a slight fall in yield from nine to eleven months, but, with the continuation of the December rains, a marked decrease in yield occurred at twelve months. Thereafter, with drier weather, yields increased steadily and rapidly attaining a maximum at fifteen months, which was slightly above the 15-month yield attained by B.41227. Pol. % Cane and Juice Purity followed the yield curve. Analyses of arrowed and non-arrowed canes shewed that the arrowed canes markedly deteriorated following the onset of the "end-of-the year" rainy season. The non-arrowed canes however, continued to grow and ripen rapidly and this may also be inferred from the plotted data in Figure I.

It should be noted, that during the 1955 Spring the rainfall was heavier than average for this period of the year.

2. SOPHIA 13 E.

Date of Planting 5.4.54. Reaping dates: 5.1.55 (9 months); 4.3.55 (11 months); 5.4.55 (12 months); 13.5.55 (13 months); 7.7.55 (15 months).

TABLE II.
SOPHIA 13 E (Plants).

Age in Months.	Tone 96° Sugar per Acre.				Pol. % Cane.			
	B. 41227.	B. 37161.	D. 37/45	D. 158/41.	B. 41227.	B. 37161.	D. 37/45.	D. 158/41.
9 Months	4.13	4.17	3.09	3.63	14.09	14.03	12.22	14.17
11 „	5.89	4.86	4.49	4.11	14.24	13.42	12.01	12.45
12 „	5.98	5.53	5.01	4.86	14.82	14.26	12.30	12.97
13 „	6.91	6.10	5.60	4.87	15.69	14.44	13.49	13.97
15 „	5.53	5.66	4.45	5.81	14.91	14.81	12.47	14.09

In this experiment, in which no variety arrowed, the varieties B.41227, B.37161 and D.37/45, ripened rapidly, giving progressively higher yields from nine to thirteen months. However, the mid-year rainy season which commenced in May promoted tillering and resulted in a heavy fall in Sucrose % Cane, Juice Purity and yield at fifteen months age (July).

D.158/41. This variety differed from the other three in that the yield of sugar per acre continued to increase up to fifteen months age in spite of the mid-year rains. The Pol. % Cane and Juice Purity followed the yield curve.

It should be noted therefore, that in the absence of arrowing, D.158/41 is a late-maturing variety and also one which does not readily deteriorate in Pol. % Cane or in Juice Purity with the advent of rain.

The mid-year rainfall of 1955 was 25% less than average.

3. SOPHIA 4 E.

Date of Planting. 17.7.54. Dates of reaping: 26.4.55 (9 months); 17.6.55 (11 months); 16.7.55 (12 months); 13.8.55 (13 months); 18.10.55 (15 months).

TABLE III.
SOPHIA 4 E (Plants).

Age in Months.	Tone 96° Sugar per Acre.				Pol. % Cane.			
	B. 41227.	B. 37161.	D. 37/45.	D. 158/41.	B. 41227.	B 37161.	D 37/45.	D. 158/41.
9 Months	3.02	2.66	3.67	3.89	10.33	11.09	11.27	10.02
11 „	5.72	4.60	5.37	6.25	13.06	11.77	12.26	12.49
12 „	5.77	4.34	6.02	6.08	12.94	11.71	12.01	13.44
13 „	5.37	3.65	5.49	5.81	12.28	11.15	13.31	13.95
15 „	4.85	4.64	7.67	6.18	12.07	12.31	14.11	12.83

In this experiment all four varieties followed the same trend up to thirteen months age, in that increased yields continued up to eleven to twelve months. Thereafter yields fell owing to the onset of the mid-year rains which caused a renewal of growth at the expense of stored sugar. With the advent of drier weather in the Autumn, conditions favourable to ripening reappeared and B.37161 and particularly D.37/45 ripened rapidly, while D.158/41 did so more slowly. B.41227 on the other hand continued to grow at the expense of stored sugar and when reaped at fifteen months had not yet equalled the yield it had attained at eleven months prior to the onset of the mid-year rains.

In this experiment arrowing occurred in D.37/45, D.158/41 and B.37161 between fourteen and fifteen months age, i.e. during September and October. B.41227 did not arrow. When reaped at fifteen months the arrowed canes of the first two varieties were of higher Pol. % Cane and Juice Purity than the non-arrowed canes but the reverse was the case with B.37161.

SUMMARY.

While each variety possesses certain general growth and ripening characteristics, these may be variously affected and modified: (i), by climatic conditions (more particularly rainfall), and, (ii), depending on whether the variety has arrowed or not, to what degree, and at what age.

The three experiments described in this paper were all reaped as plants and the conclusions therefore pertain only to this cycle.

B.41227. This non-arrowing variety is definitely a late-maturing one and there will be considerable loss of sugar if it is reaped early as plants. In the absence of heavy rainfall, it appears that this variety is best reaped as plants at thirteen months age.

The onset of heavy rains takes longer to affect yields of sugar and juice quality in this variety than in the other three tested. On the other hand, this variety also takes longer to resume ripening once rains have caused a renewal of growth.

B.37161. This variety is not perhaps as early maturing as is generally thought since during the prolonged ripening weather of the 1955 Spring crop it continued to increase its yield of sugar up to thirteen months age, at which age the mid-year rainy season commenced. It is however, very sensitive to rainfall (particularly if arrowing has taken place), and juice quality and yields as plants fall very rapidly if heavy showers prevail. For this reason it is desirable that B.37161 be reaped early if heavy showers occur or are to be expected.

D.158/41. Unlike the other heavy–arrowing cane varieties at present under test in British Guiana, D.158/41, maintains its juice quality reasonably satisfactorily during heavy rains and resumes ripening with dry weather. Its singular behaviour in this connection is possibly due to the fact that this variety grows very uniformly and when arrowing does occur, this takes place

in almost 100 per cent of the stalks, while the new tillers grow more slowly and regularly than do those of the other varieties. In addition, unlike D.37/45 and B.37161, the tops of which rot and fall when rainy weather follows arrowing, the arrowed stalks of this variety send out shoots from the top buds which tend to keep the arrowed stalks alive longer and this is probably responsible for a lower rate of deterioration of these stalks.

D.37/45. This heavy-arrowing variety is typical of the canes of this type grown locally in that it is very sensitive to rainfall when arrowing has occurred, and both yields and juice quality are markedly reduced under such conditions. On the other hand, if ripening conditions prevail from eleven months age onwards, D.37/45 ripens very rapidly up to fifteen months age. It is for these reasons that D.37/45 and other heavy arrowing varieties are to be regarded purely as Autumn crop canes in British Guiana. (See Page 39).

These studies have demonstrated in the cases of B.37161 and D.37/45 that generalisations as to the behaviour of certain varieties without careful investigation over a range of conditions might well be mis-leading. The evidence from these three experiments for instance, casts grave doubts as to these two varieties being as early-maturing as is generally believed. This view has probably become accepted owing to the rapidity with which these varieties fall in yield and quality when heavy rains are encountered, particularly following arrowing—a characteristic which has shewn it to be advisable to reap them before such conditions obtain even if this necessitates reaping at a relatively early age.

Another point that these studies has demonstrated is the fact that a cane that has arrowed does not necessarily commence to deteriorate following this occurrence. Indeed, if *dry* weather prevails following arrowing, such canes continue to increase in sucrose content for a considerable time without any loss in weight necessarily occurring. On the other hand, if rainy conditions occur, it is the general rule that the arrowed canes deteriorate more rapidly than do non-arrowed canes, but different varieties may shew considerable differences in the rate of such deterioration.

To conclude, the growth and ripening behaviour of different varieties of sugar cane is a function of many factors, the chief ones being: the inherent characteristics of the particular variety; the amount and distribution of rainfall particularly during the ripening period; the age of the cane, and whether arrowing has occurred or not, and to what extent.

Owing to the nature of the annual distribution of rainfall and to the fact that there are two crop seasons per annum in British Guiana, the factors mentioned above as affecting yields are susceptible to a considerable number of possible combinations. However, from studies such as those under discussion, certain basic facts may be established and from these it is hoped that means will be found to so relate them with the varieties grown commercially to allow of obtaining the best results from these varieties under the existing conditions.

FERTILIZER EXPERIMENTS.

BY

L. S. BIRKETT, C. CAMERON and H. PAUL*.

The fertilizer experiments reaped in 1955 consisted of eight N, P, K, experiments of the same type as those reaped the previous year[1]. Three of these were continuation experiments on the same sites while the other five (all Latin Squares) were laid down on fields which had not previously been tested for response to these plant nutrients. The fertilizer treatments were the same as those described in Bulletin No. 23, except that the potash was applied at the standard rate as the muriate instead of as the sulphate. The method and times of application of these fertilizers were also the same as in the previous experiments of this series, while the sampling and analyses of the leaves were also carried out as before.

In addition, in field Blairmont 18 M., the site of the experiment reaped in 1954 was used to determine the residual effects of potash and phosphate, and of the effects of applications of larger rates of P_2O_5 per acre.

YIELD DATA.

The yields of 96° sugar per acre for the various treatments in the nine experiments are presented in Table I.

DISCUSSION OF RESULTS.

Blairmont, 9 R.P. Plant cane, B.41227. Soil Type : Frontland Clay.

In this experiment, applications of nitrogen resulted in very small increases in yield of sugar, the increases not being significant. No benefit was derived from the application of potash but small gains resulted from applications of phosphate which were not significant however.

Sophia, 17 W. First Ratoons, B.41227. Soil Type : Blairmont Loam.

This is a continuation experiment and the non-application of nitrogen for the second year to the control plots resulted in partial nitrogen starvation in cane grown on them. In consequence, applications of three cwt. of sulphate of ammonia per acre in the N_3 treatment more than doubled the yield of the control while the six cwt. per acre rate in the N_6 treatment more than trebled the yield from the controls. Of considerable practical importance, is the fact that increasing the application of Nitrogen from 70.5 lbs. to 141.0 lbs. per

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TABLE 1.

FERTILIZER EXPERIMENTS REAPED IN 1955 — YIELDS, TONS 96° SUGAR PER ACRE.

Experiment.	Soil Type.	Cane Variety.	Cycle.	TONS 96° SUGAR PER ACRE.						
				Control.	N_3.	N_6.	$N_6 P_6$.	$N_6 K_4$.	$N_6 P_6 K_4$.	Signif. Diff.
Blairmont— 9 R.P.	Frontland Clay.	B. 41227	Plants	4.69	4.81	4.92	5.20	5.01	5.40	nil.
Sophia — 17 W.	Blairmont Loam.	„	1st R.	1.62	3.66	5.25	5.90	5.66	5.56	0.47
Sophia — 7 W.	Blairmont Clay.	„	„	1.66	5.38	6.01	5.97	6.95	6.78	0.63
Bath — 2 F.	Frontland Clay.	„	„	2.83	3.23	4.20	5.74	4.61	5.63	0.65
Bath — 14 V.	Frontland Clay.	„	„	3.70	4.58	4.86	6.70	5.08	6.79	0.97
Bath — 20 O.B.	Frontland Clay.	„	„	3.71	4.56	5.46	6.10	5.68	6.35	0.62
Wales — 51 V.B.	Intermediate Pegassy Clay.	„	„	4.01	4.12	4.28	4.56	4.68	5.15	0.32
Blairmont— 19 O.	Frontland Clay.	„	2nd R.	4.71	4.97	5.24	5.68	5.10	5.50	nil.
				Control.	$N_3 P_{12}$.	N_6.	$N_6 P_R$.	$N_6 K_R$.	$N_6 P_{12} K_R$.	
Blairmont— 18 M.	Frontland Clay.	„	3rd R.	3.14	5.03	3.00	4.04	2.84	5.15	0.68

acre, resulted in an increase in yield that is highly significant statistically. This result confirms previous experiments which have indicated that on this soil type, six cwt. of sulphate of ammonia per acre should be applied to ratoons instead of four cwt. per acre as is present usual practice.

As with the plant cane cycle, the application of phosphate resulted in a statistically significant response in yield of sugar while potash also gave an increased yield which again just failed to attain significance. As in the plant cane crop, the gains from phosphate and potash are not additive and the N_6 P_6 K_4 treatment offered no advantage over that of the N_6 P_6 treatment.

Both leaf and juice analyses shew that the phosphate response is not due to an inadequate supply of phosphate. It may be due to a low calcium status but this requires confirmation. The gain from potash both in plants and first ratoons appears to be dependent on factors other than a deficiency of potash since potash was not shewn by leaf analysis to be deficient in the plant cane crop although it bordered the tentative critical levels[2] as first ratoons.

Sophia, 7 W. First Ratoons, B.41227. Soil Type; Blairmont Clay.

This is a continuation experiment and like that in Sophia, 17 W., partial nitrogen starvation was apparent in the control plots. A three-fold increase in yield over the control was obtained by applying three cwt. of sulphate of ammonia per acre. The incremental gain by increasing the nitrogen application by a further three cwt. of sulphate of ammonia per acre was considerably less but this also proved to be statistically significant.

There was no response in yield from the application of phosphate. There was however, a significant response to the application of potash in the N_6 K_4 treatment while the significant response in the N_6 P_6 K_4 treatment can also be attributed to the potash.

In the plant cane cycle neither phosphate nor potash gave any significant yield response and it is of interest that a response to potash was obtained in the first ratoons. In this connection, it should be noted that the yields of cane and of sugar per acre were higher in the first ratoon cycle than in the plant cane cycle. It should also be noted that in spite of the significant response to potash in the first ratoons, the leaf analyses indicate no deficiency of this nutrient.

Wales, 51 V.B. First Ratoons, B.41227. Soil Type: Intermediate Pegassy Clay.

The experiment in this field was also a continuation from the plant cane cycle. Unlike the two continuation experiments already considered, there was no nitrogen starvation in the control plots on this soil type, indicating either a higher level of slowly available nitrogen in the soil, or better conditions for nitrification, or both. In consequence of the naturally high level of soil nitrogen, yield responses to nitrogen applications were very small and did not approach statistical significance. A similar result was obtained in the plant cane cycle.

As in the previous cycle, the application of phosphate at the rate of 125 lbs. P_2O_5 per acre just fell short of attaining significance.

The application of 215 lbs. K_2O per acre, produced an increase in yield in the plant cane crop which was just short of being significant. The same rate of application to the first ratoons also resulted in an increase in yield which in this cycle proved to be significant.

As in the case of the plant cane cycle, the incremental gains from potash and phosphate are additive when both of these nutrients are applied together in the N_6 P_6 K_4 treatment, which in consequence gave a yield increase which is highly significant.

It should be noted that in the case of this experiment the leaf analyses gave no indication of phosphate or potash deficiencies. It is possible that the beneficial effects from the phosphate application might be due to phosphate combining with "active" alumina or in supplying calcium. No reason can be given at present for the response which was obtained from the potash application.

Bath, 20 O.B. First Ratoons, B.41227. Soil Type: Frontland Clay.

In this experiment, significant yield responses were obtained from applications of nitrogen at the N_3 as well as the N_6 levels. The Phosphate application gave an increase in yield which just attained significance. The Potash application also gave an increase in yield which however failed to attain significance. Their combined influence in the N_6 P_6 K_4 treatment produced an incremental gain that was highly significant.

It should be noted that while leaf analysis indicated a deficiency in potash, the potash response was not statistically significant in spite of an adequate increase in potash % leaf.

Bath, 14 V. First Ratoons, B.41227. Soil Type : Frontland Clay.

The Nitrogen application at the N_3 level gave an increase in yield over the control which just fell short of significance while the *incremental* gain from the further application of 3 cwt. of sulphate of ammonia per acre (N_6 treatment) was considerably less. However, the increase in yield obtained from the 6 cwt per acre rate is significantly higher than the yield obtained from the control plots.

The application of phosphate at the standard rate gave an increase in yield which is highly significant but that obtained from the potash application was not significant.

The yield from the N_6 P_6 K_4 treatment is only slightly higher than that of the N_6 P_6 treatment confirming that the main response is to phosphate.

Bath 2 F. First Ratoons, B.41227. Soil Type : Frontland Clay.

The results from this experiment duplicate those obtained in the preceding one (Bath, 14 V.).

In this experiment, leaf analysis shewed both phosphate and potash to be deficient. The failure to obtain a significant response from the application of potash appears to be attributable to an insufficient uptake of the potash applied to the soil, the reason for which has not been ascertained. (See Table III). The increase in the uptake of potash from the phosphate application is equal to that from the potash application and the response to phosphate is probably one to both phosphate and potash. That a response to potash, if absorbed, is obtainable is indicated by the higher yield from the N_6 P_6 K_4 treatment.

Blairmont, 19 O. Second Ratoons, B.41227. Soil Type : Frontland Clay.

Increases in yield, which however, were not statistically significant, were obtained from applications of nitrogen. The application of phosphate also gave an increase in yield which was not statistically significant. No response was obtained from the application of potash. Leaf analysis shewed phosphate and potash levels to have been adequate while juice analysis for phosphate confirmed the adequacy of the phosphate uptake by the plant.

Blairmont, 18 M. Third Ratoons, B.41227. Soil Type : Frontland Clay.

This experiment was continued on the plots of the standard N, P, K, experiment reaped in 1954 and described in Bulletin No. 23[1]. The results of the previous reaping shewed that instead of applications of nitrogen producing increases in yield as in usual, such applications reduced yields. This result was attributed to the effect of sulphate of ammonia in depressing the uptake of phosphate from a soil already deficient in this nutrient. When phosphate was added in conjunction with nitrogen a highly significant increase in yield was obtained. Potash applications also gave an increase in yield which however was not significant.

While the application of 125 lbs. of P_2O_5 per acre gave a substantial increase in yield, leaf and juice analysis shewed that a relatively small proportion of the phosphate applied had been absorbed by the plant and suggested : (a), that this particular soil possessed a high capacity to fix phosphate, and, (b), that still greater yield increases would be forthcoming if more phosphate could be absorbed by the plant. It was therefore desirable that these possibilities should be investigated. A simple method of doing so was to measure : (a), the residual effect, if any, of the phosphate applied in 1954, and, (b), to determine whether by doubling the rate of application of phosphate the increased uptake of phosphate was accompanied by a still greater increase in yield. At the same time, (c), the residual effect of potash was tested. The treatments given in the 1955 experiment on this site were designed to give information on these aspects.

A comparison of the treatments which were used in 1954 with those applied in 1955 is as follows :

Treatment 1954.		Treatment to the same plots in 1955.	
Control	(no fertilizers).	Control	(no fertilizers).
N_3	= (3 cwt. sulphate of ammonia per acre).	N_3P_{12}	= 3 cwt. sulphate of ammonia + 12 cwt. single superphosphate per acre.
N_6	= (6 cwt. sulphate of ammonia per acre).	N_6	= (as previous cycle).
N_6 P_6	= 6 cwt. sulphate of ammonia + 6 cwt. single superphosphate per acre.	N_6 P_R	= 6 cwt. sulphate of ammonia only. (Test of residual effects of the previous application of 6 cwt. single superphosphate per acre).
N_6 K_4	= 6 cwt. sulphate of ammonia + 4 cwt. of sulphate of potash per acre.	N_6 K_R	= 6 cwt. sulphate of ammonia only. (Test of residual effects of the previous application of 6 cwt. sulphate of potash per acre).
N_6 P_6 K_4	= 6 cwt. sulphate of ammonia + 6 cwt. single superphosphate + 4 cwt. of suphate of potash per acre.	N_6 P_{12} K_R	= 6 cwt. sulphate of ammonia + 12 cwt. of single superphosphate per acre + Residual effect from previous application of sulphate of potash.

The yields obtained in 1955 are presented in Table I but the following comparison (Table II) of the results of the two cycles using indices with the N_6 yield taken as 100, is instructive.

TABLE II.

Treatment.		Relative yields 96° Sugar/Acre. (N_6 yield = 100).	
1954.	1955.	1954.	1955.
Control	Control	108.0	104.7
N_3	—	107.5	—
N_3	N_3 P_{12}	107.5	167.7
N_6	N_6	100.0	100.0
N_6 P_6	N_6 P_R	135.4	134.7
N_6 P_6 K_4	N_6 P_{12} K_R	146.9	171.7
N_6 K_4	N_6 K_R	113.7	94.7

From the data presented in Table II it is seen (comparing the relative yields from the N_6 treatments with the control) that, as in the previous cycle, the application of sulphate of ammonia by itself depresses the yield. It is also seen (comparing the N_6 with the N_6 K_R treatments) that there is no residual benefit from the previous potash application. On the other hand, rather unexpectedly, considering how little phosphate is taken up by the cane plant from applications of superphosphate, there is a residual benefit from the phosphate

TABLE III.

FERTILIZER EXPERIMENTS REAPED IN 1955 — LEAF ANALYSIS DATA*.

Experiment.	Soil Type.	Cycle.	NITROGEN % LEAF DRY MATTER.			P_2O_5 % LEAF DRY MATTER.				K_2O % LEAF DRY MATTER.				
			Control.	N_3.	N_6.	Control.	N_6.	N_6P_6.	N_6K_4.	Control.	N_6.	N_6P_6.	N_6K_4	$N_6P_6K_4$
Blairmont— 9 R.P.	Frontland Clay.	Plants.	1.98	2.06	2.08	.46	.44	.51	.38	1.73	1.66	2.05	2.04	2.04
Sophia — 17 W.	Blairmont Loam.	1st R.	1.58	1.98	2.29	.57	.47	.52	.41	1.76	1.40	1.59	1.80	1.92
Sophia — 7 W.	Blairmont Clay.	"	1.58	1.96	2.08	.56	.57	.75	.54	1.76	1.83	1.90	1.92	1.92
Bath — 2 F.	Frontland Clay.	"	1.48	1.79	2.07	.30	.28	.42	.31	1.27	1.28	1.39	1.39	1.46
Bath — 14 V.	Frontland Clay.	"	2.04	2.35	2.29	.41	.46	.56	.36	1.59	1.61	1.68	1.68	1.92
Bath — 20 O.B.	Frontland Clay.	"	1.44	1.93	2.07	.40	.36	.57	.29	1.29	1.30	1.34	1.59	1.77
Wales — 51 V.B.	Intermediate Pegassy Clay.	"	2.51	2.64	2.68	.78	.62	.83	.61	1.78	1.83	1.79	2.26	2.26
Blairmont— 19 O.	Frontland Clay.	2nd R.	2.12	2.41	2.58	.55	.51	.53	.48	1.68	1.56	1.63	1.80	1.78

* Note: Variety B. 41227 planted in all experiments.

TABLE IV.

FERTILIZER EXPERIMENTS REAPED IN 1955—JUICE ANALYSIS DATA.

Experiment.	Soil Type.	Cane Variety.	Cycle.	P_2O_5 % JUICE.					
				Control.	N_3.	N_6.	N_6P_6.	N_6K_4.	$N_6P_6K_4$.
Blairmont— 9 R.P.	Frontland Clay.	B. 41227	Plants.	.025	.016	.015	.019	.013	.020
Sophia — 17 W.	Blairmont Loam.	„	1st R.	.049	.036	.028	.038	.028	.037
Sophia — 7 W.	Blairmont Clay.	„	„	.061	.046	.042	.044	.037	.043
Bath — 2 F.	Frontland Clay.	„	„	.005	.004	.003	.006	.003	.006
Bath — 14 V.	Frontland Clay.	„	„	.004	.004	.003	.006	.003	.008
Bath — 20 O.B	Frontland Clay.	„	„	.015	.011	.010	.022	.011	.025
Wales — 51 V.B.	Intermediate Pegassy Clay.	„	„	.020	.018	.013	.017	.012	.024
Blairmont— 19 O.	Frontland Clay.	„	2nd R.	.019	.015	.013	.025	.017	.026
				Control	N_3P_{12}	N_6	N_6P_R.	N_6K_R.	$N_6P_6K_R$.
Blairmont— 18 M.	Frontland Clay.	„	3rd R.	.004	.013	.003	.004	.003	.012

applied to the previous cycle which is equal to that obtained therefrom in the first place. It is also to be noted that significantly higher yields are to be obtained, as might be expected in this case, from higher rates of application of phosphate which are accompanied by a higher level of phosphate uptake as shewn both by the leaf and juice analyses in Tables III and IV. It should particularly be noted, that when the deficiency in phosphate is partly rectified, better than average yields are obtained. In the absence of applied phosphate however, the yields from this area are appreciably below normal.

Nutrient Deficiencies as Indicated by Leaf and Juice Analyses.

In the discussion which follows on the applicability of foliar and juice analyses as means of determining nutrient deficiencies, the results of the fertilizer experiments reaped in 1954 and 1955 will be considered together.

The responses in terms of sugar which result from the application of any given plant nutrient may be due directly to the satisfaction of a deficiency of the particular nutrient which has been supplied, or, in many cases, to indirect effects which accompany the application. Foliar and juice analyses are very useful in drawing to attention and giving explanations for such indirect effects which are the result of interactions in the soil or in the plant itself. Such interactions as have been observed in these experiments will be noted in the discussion that follows.

For convenience, each major nutrient will be considered separately. All percentages given in the case of leaf analyses are on a dry matter basis.

1. *Nitrogen.* Normally, application of nitrogen to the soil results in an increase in the nitrogen content of the leaf. Omitting two instances where a high degree of nitrogen starvation was responsible for abnormally high responses to nitrogen, and one case where phosphate was so deficient that no response to nitrogen could be obtained until this limiting deficiency was first satisfied (at least in part), there is a high correlation between the Nitrogen % leaf and the degree of response to applications of nitrogen in the form of 3 cwt. of sulphate of ammonia. An equally high correlation is obtained between the relative increase in leaf nitrogen and the relative yield of 96° sugar.

Yield responses to applications of nitrogen are consistently obtained where the nitrogen content of the leaf is below 2.25% for the sampling ages and times of application of the fertilizers adopted in these experiments. However, when the nitrogen percent leaf dry matter is within the range 2.10 to 2.35%, the responses were not statistically significant although they might approach significance on light soils, e.g. the Blairmont loams. In view of the key part played by nitrogen in obtaining high yields in British Guiana, it is recommended that a nitrogen content less than 2.20% leaf dry matter be regarded as indicating deficiency of this nutrient at the sampling ages used in these studies and where the full nitrogen application has been given in a single dose at the ages previously given.

FIGURE I.

MEAN RELATIONSHIP BETWEEN NITROGEN % LEAF & APPLIED NITROGEN FOR VARIOUS SOIL TYPES (1954 & 1955).

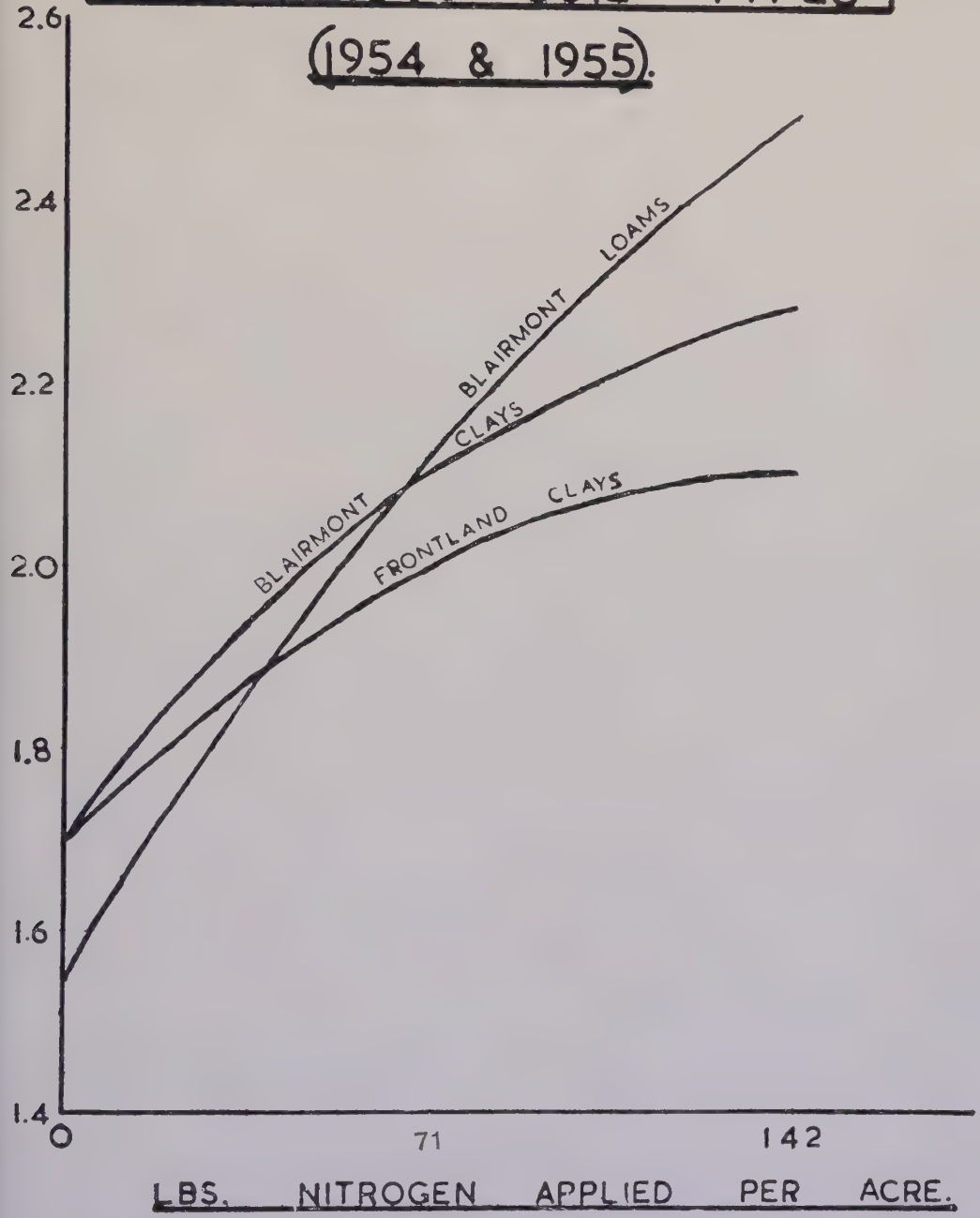
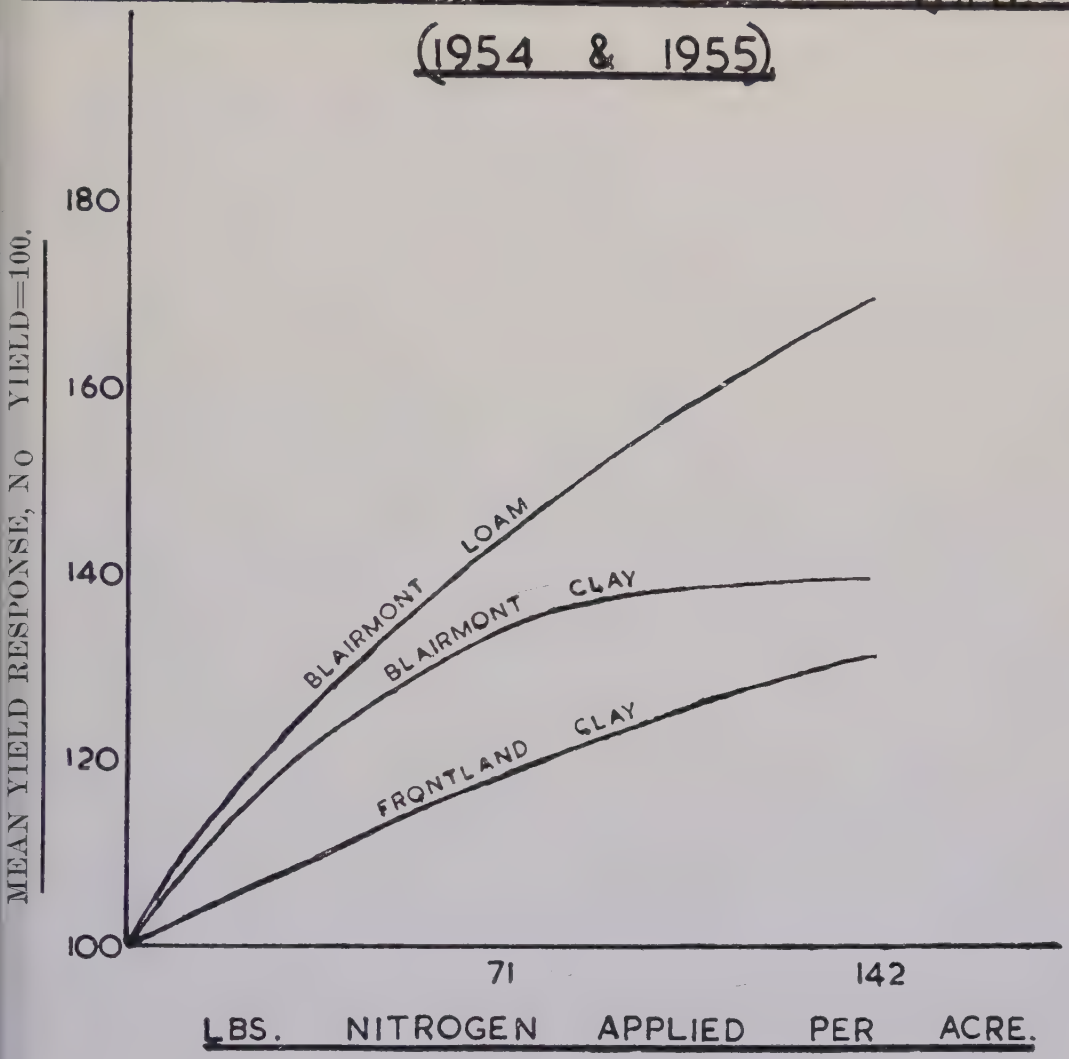


FIGURE II.

MEAN YIELD RESPONSES TO NITROGEN FOR VARIOUS SOIL TYPES - (RATOONS). (1954 & 1955).



The ultimate aim of foliar diagnosis is not only to indicate where nutrient deficiencies exist but to allow of determining how much of the deficient nutrient should be applied to satisfy the deficiency. For nitrogen, the data are insufficient to allow of relating nitrogen requirements to nitrogen level in the leaf with exactitude at present. Indeed, the indications are that this ideal is likely to be difficult of attainment using any single simple mathematical formula since the percentage uptake of, and response to nitrogen, varies with soil type, cycle, and probably also with climatic conditions and cane variety.

The effects of soil type on Nitrogen % Leaf and Relative Yield Response are shewn in Figures I and II, using mean data from these experiments.

Certain indirect effects from the application of sulphate of ammonia are worthy of attention.

Applications of sulphate of ammonia depress the uptake of phosphate which is reflected in both leaf and juice analysis—more particularly the latter. A comparison of P_2O_5 % leaf dry matter for the N_0 and N_6 treatments on clay soils, gives the means as .500 and .465% respectively*. In the juice, the corresponding percentages of P_2O_5 are .028 and .016.% The differences are statistically significant in each case.

Where the available phosphate content of the soil is low, applications of sulphate of ammonia by still further reducing its uptake by the plant may result in such applications actually depressing yields. While such instances are rare in British Guiana, field 18 M., Blairmont Estate, affords an example.

Applications of sulphate of ammonia do not appear to affect the uptake of potash in any way—at least as indicated by leaf analyses. Such applications increase the uptake of magnesium however, as has been shewn previously.[2] The effect of applications of sulphate of ammonia on other plant nutrients in local soils shews that the uptake of calcium is frequently increased.[2,3]

In a previous study,[4] applications of nitrogen were shewn to decrease the Pol. % Cane and the Purity of the juice on clay soils. The effects on pegassy soils were erratic. For the experiments under consideration here however, applications of nitrogen while tending to decrease Pol. % Cane and Purity of the juice have not had the same marked effect as those obtained in the earlier studies. The reasons for this are not known but it may be that the cane variety used in these experiments (B.41227) has a higher nitrogen requirement than the standard varieties used in the earlier fertilizer studies, or, that the high rainfall of 1954 and 1955 allowed better utilisation of the nitrogen applied resulting in a more normal maturing of cane to which

* The phosphate uptake as determined by leaf analysis was not typical in the case of the experiment on the pegassy clay and has for this reason been omitted in arriving at the averages. In the case of the juice analysis however, the phosphate uptake followed the normal pattern.

heavy applications are given than is the case at lower rainfall levels. Where nitrogen is markedly deficient (as shewn by leaf analysis), Pol. % Cane and Juice Purity have been improved by applications of sulphate of ammonia.

2. *Phosphate.* Applications of calcium superphosphate to soils result in an increase in the phosphate contents of both leaf and juice. However, the recovery by the plant of such added phosphates is low and variable. In general, the major factors affecting the absorption of applied phosphate are : the nature of the soil, its tilth, the rate of application of sulphate of ammonia, and probably the weather conditions prevailing during the early stages of growth of the crop.

Phosphate fixation appears to be greatest in the heavy frontland clays and least in the Blairmont loams. The data on the pegassy soils is insufficient to allow of classifying them in this respect. On *a priori* grounds it might be anticipated that on very acid pegassy soils, iron and "active" alumina would effectively fix the phosphate as insoluble iron and aluminium phosphates. However, on the pegassy clays of Diamond 37 G.G., and Wales 51 V.B., the uptake of phosphate from the calcium superphosphate applied is higher than in the case of most of the heavy clays.

The effect of sulphate of ammonia in decreasing the uptake of phosphate by the cane plant has already been mentioned under "Nitrogen" and need not be further considered here.

Two indirect effects which arise from applying calcium superphosphate to soils and which require consideration are its effect in (a), increasing the uptake of potash by the cane plant, as well as (b), its effect in increasing the uptake of calcium. In virtue of these indirect effects, significant increases in yield may be obtained from applications of phosphates to soils not deficient in phosphate but which are deficient in potash and/or calcium. In this connection, it should be noted that in the fertilizer experiments under consideration, the application of 125 lbs. P_2O_5 per acre as calcium superphosphate results in an increased K_2O content in the leaf practically equal to that which would be obtained from the application of 4 cwt. of sulphate of potash per acre.

From these experiments, the P_2O_5 content of both leaf and juice appear to afford a satisfactory means of determining the phosphate status of the sugar cane in British Guiana. This confirms the results of previous studies.[2,3]

The levels of leaf phosphate at the sampling ages used and of juice phosphate at time of reaping are highly correlated, the correlation coefficient between these P_2O_5 contents being significant at the .01 level of significance.

The relationship between the P_2O_5 of the leaf and juice and the response to the application of 125 lbs. of P_2O_5 per acre as calcium superphosphate is seen from Table V.

TABLE V.

Response to 125 lbs. P_2O_5 per acre in relation to the P_2O_5 contents of Leaf and Juice.

Experiment.	Cycle.	P_2O_5 %.		Response.	Remarks.
		Leaf.	Juice.		
Bath — 2 F.	1 R.	.28	.003	+	
Blairmont — 18 M.	2 R.	.32	.004	+	
Blairmont — 18 M.	3 R.	.32	.003	+	
Blairmont — 28 R.P.	2 R.	.34	.006	0	Insufficient P_2O_5 absorbed.
Bath — 20 O.B.	1 R.	.36	010	+	
Blairmont — 28 R.P.	2 R.	.37	.005	+	
Blairmont — 9 R.P.	P.	.44	.015	0	
Bath — 14 V.	1 R.	.46	.003	+	
Blairmont — 28 B.K.	1 R.	.46	.019	0	
Sophia — 17 W.	1 R.	.47	.028	+	Probably a response to calcium.
Wales — 51 V.B.	P.	51	.013	0	
Blairmont — 19 O.	2 R.	.51	.013	0	
Sophia — 7 W.	P.	.56	.045	0	
Sophia — 7 W.	1 R.	.57	.042	0	
Blairmont — 52 B.L.	1 R.	.58	.018	0	
Sophia — 17 W.	P.	.59	015	+	Probably a response to calcium.
Wales — 51 V.B.	1 R.	.62	.013	0	
Diamond — 37 G.G.	1 R.	.89	.025	0	

From the above data it is seen that a statistically significant response to 125 lbs. of P_2O_5 per acre as calcium superphosphate may be expected where the P_2O_5 % leaf dry matter is .45% or below. Responses are also obtained where the P_2O_5 % leaf is within the range .46%—.50% but these are not usually statistically significant. In general, where significant responses are obtained at higher levels of P_2O_5 % leaf they are attributable to indirect effects such as have been already noted above.

A response to phosphate as such may be anticipated where the P_2O_5 % juice is below .012% for the variety B.41227. Responses to applications of phosphates at higher levels of phosphate % juice are attributable to the same indirect effects referred to previously.

As in the case of nitrogen, it is not possible to predict from the leaf analysis the rate of application of phosphate which is necessary to correct a deficiency, since very variable amounts of applied phosphate are absorbed by the plant, depending upon soil conditions. In this connection it should be noted that in these experiments the correlation between the relative increase in P_2O_5 % leaf and the relative yield arising from such uptake of phosphate is statistically insignificant. This arises from the fact that where phosphate is applied, it is taken up by the plant in amounts which are not necessarily related to its requirements but to the degree controlled by soil conditions. Thus, even where the phosphate content of the leaf is sufficiently high as to indicate an

adequacy of phosphate supplies, or even of luxury consumption, a relatively high uptake of phosphate occurs where fixation by the soil is not excessive. On the other hand, phosphate uptake may be inadequate, yet, owing to a high soil fixation of applied phosphate, the absorption of applied phosphate may be low. Nevertheless, where phosphate is very deficient a considerable yield response is obtainable from a relatively small uptake of applied phosphate. This is well illustrated in fields M.18 and R.P.28.

The relationship between P_2O_5 % juice and yields which has been found in these and previous tests[2] appears worthy of further consideration in view of the abandonment of such juice analyses elsewhere.

Assuming that the phosphate in juice is a reserve supply available for use in periods when, for one reason or another, absorption of phosphate from the soil is at too low a rate to meet current actual or potential consumption, some correlation between the level of this reserve and yield might be expected. Where this reserve is very high the plant is living luxuriously in respect to phosphorus requirements. If however, the reserves are below a certain minimum level the plant may be operating on too low a margin of reserves to maintain full growth at all times, particularly under temporarily unfavourable soil conditions. Somewhere between these limits is a critical level that represents a safe reserve without luxury uptake. For the cane variety B.41227, this level as measured by the P_2O_5 % juice at time of reaping appears to be approximately .013 to .015%. In this connection, the effect of sulphate of ammonia in reducing the P_2O_5 % leaf and juice requires consideration. Is the effect merely due to a spreading of the phosphate owing to the increased growth of cane which usually accompanies the application of sulphate of ammonia, or, does it represent an actual decrease in the absorption of phosphate from the soil ? To answer this question, the actual amounts in lbs. of P_2O_5 in juice per acre have been calculated on the assumption that the cane contains 14% fibre. Omitting the yields from fields 7 W. and 17 W. Sophia as first ratoons, where the control plots were obviously suffering from an appreciable degree of nitrogen starvation, the mean quantities of P_2O_5 taken up in the juice of the cane in lbs. per acre were :—

Control Plots	N_3 Plots.	N_6 Plots
16.67	14.04	11.37

These differences are highly significant statistically. Inspection of the data discloses however, that the greatest decreases occur where there is luxury uptake of phosphate, and that a decreased uptake of phosphate where the available supply of phosphate is already very low, rarely occurs. Where in such cases it does occur, than applications of sulphate of ammonia depress the yields.

3. *Potash.* In these experiments, statistically significant correlations are not obtained between the yield responses from applications of potash and (i), the level of potash in the leaf; or (ii), the relative increase in leaf potash obtained from applications of potassic fertilizers. This is an unexpected result

since, as has been noted by Evans[3], in Mauritius, Hawaii and Jamaica, potassium is the element the status of which can be most reliably diagnosed by foliar analysis. Failure in this respect in these experiments may be due to the fact that at the sampling ages used, the potash level in the leaf is not a sufficiently sensitive indicator of the potash status of the plant and the leaves should be sampled at later stages of growth in the case of this nutrient. Alternatively, it may be that indirect effects are involved with elements whose levels have not been determined. Evans[3] notes instances of such effects. It is also possible that the question of nutrient balance is involved.

In the seventeen experiments under consideration, the application of potash gave increases in yield (average for all experiments = 6.4%) in all except two cases. Of the fifteen experiments in which yield increases were recorded, only two were statistically significant however, but four others were just short of being significant. These yield increases are attributable partly to an increased yield of cane and partly to an increase in the Pol. % Cane resulting from the application of potash. Taking the experiments as a whole, 45% of the increased yield from potash is due to an increase in the yield of cane per acre, and 55% from the higher Pol. % Cane. As has been shewn in the discussion of phosphate, applications of calcium superphosphate increase the potash uptake sufficiently to satisfy potash deficiencies in most cases. The application of lime has also been shewn[2] to have a similar effect.

SUMMARY.

To summarise, foliar analysis is seen to have good possibilities for diagnosing nutrient deficiencies in the case of nitrogen and phosphate in the sugar cane under local conditions. Juice analysis also offers a suitable approach to the problem in the case of phosphate at least, provided the effect of cane variety is realised and allowed for as has been noted previously[2].

For the foliar diagnosis technique, the sampling ages adopted in these studies appear to be suitable in the case of nitrogen and phosphate but not for potash. However, in the case of nitrogen the adequacy of the nitrogen application should be checked by a further analysis at five months in the case of *light soils* e.g. the Blairmont loams.

Considerable work remains to be done to determine the most suitable tissue or combination of tissues to be used as an index of the nutrient status of the plant, the most suitable sampling age for these tissues, and the effect of weather and soil conditions on the interpretation of the results of the analyses, while the effect of cycle and cane variety require to be evaluated. Interactions between nutrients and the form in which the nutrient is given also require study and until more is known of these various factors and the manner in which they interact, full benefits from the plant analysis approach to scientifically controlling fertilizer programmes cannot be realised. However, the data obtained to date are sufficient to allow of considerable improvement in the use of fertilizers locally which will in turn result in increased yields and profits.

In view of the wide scale application of the foliar diagnosis technique by the local sugar companies[3] the N, P, K experiments conducted by the Experiment Station staff will be concluded in 1956 during which year, three continuation experiments will be reaped as second ratoons and a further four reaped for testing residual effects.

In conclusion, the authors would like to acknowledge the ready help given by Dr. H. Evans in having the leaf potash analyses carried out at his laboratory, and for a number of valuable comments which have been included in the text.

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TABLE I (A).—Weighted Mean Commercial Yields in East Demerara, 1955.

Variety.	Acres Harvested.	Crusher Juice. Pol. %	Crusher Juice. Purity.	Tons 96° Sugar per Acre.*
		Plant Canes.		
		100 Acres and over.		
B. 4362	682.7	14.06	82.80	4.12
B. 47225	247.6	13.58	82.54	3.99
B. 41227	1,334.1	13.53	81.90	3.97
B. 37161	1,834.3	13.80	82.56	3.84
		Under 100 Acres.		
B. 4098	23.0	13.96	82.21	4.30
Pindar	6.1	14.38	83.98	3.93
B. 4373	11.8	13.12	82.01	3.92
B. 46378	20.7	14.33	83.29	3.72
B. 47379	3.4	14.15	84.27	3.53
B. 43253	.3	13.52	85.06	3.33
B. 40105	94.1	14.25	83.55	3.15
D. 37/45	9.3	13.42	83.07	3.01
Co. 419	20.7	13.33	82.50	2.90
		First Ratoons.		
		100 Acres and over.		
B. 37161	603.0	14.13	83.00	3.81
B. 4098	414.5	14.07	83.09	3.62
B. 34104	127.1	14.07	84.01	3.47
B. 41227	1,771.1	13.97	82.33	3.40
B. 4362	309.2	14.10	82.38	3.14
		Under 100 Acres.		
Seedlings	1.0	14.34	84.35	5.00
D. 37/45	11.0	14.07	80.88	4.18
B. 40105	11.5	14.73	84.66	3.65
Co. 419	50.5	13.17	82.06	3.47
B. 43413	20.0	13.44	82.20	3.40
B. 4744	1.0	13.68	82.12	3.09
B. 47419	1.0	13.68	82.12	3.06
B. 44341	15.3	13.74	81.79	2.46
		Second Ratoons.		
		100 Acres and over.		
B. 40105	490.5	14.12	82.86	3.44
B. 4098	107.8	13.59	82.42	3.19
B. 37161	1,344.6	14.34	83.18	3.16
B. 41227	852.0	13.99	82.65	3.02
B. 34104	1,113.2	14.16	82.62	2.43
		Under 100 Acres.		
Co. 419	54.0	14.12	84.41	3.34
B. 4362	56.0	14.09	82.19	3.27
D. 62/43	18.3	13.81	82.17	2.98
D. 158/41	26.0	13.96	82.68	2.85
Mixed	28.7	15.33	83.72	2.72
		Third Ratoons.		
		100 Acres and over.		
B. 40105	437.4	14.72	84.03	3.23
B. 41227	578.9	14.01	82.73	3.13
B. 37161	529.8	14.19	83.03	2.91
B. 34104	1,861.1	14.29	83.52	2.36
		Under 100 Acres.		
B. 46378	.2	14.13	82.92	5.00
Co. 419	9.2	14.78	86.20	4.24
B. 4098	2.0	14.04	83.99	3.50
B. 4362	.3	14.13	82.92	3.33
D. 158/41	12.2	13.01	81.90	2.62
D. 62/43	4.5	13.41	82.65	2.44
P.O.J. 2878	5.7	14.68	84.22	2.32
		Old Ratoons.		
		100 Acres and over.		
B. 34104	132.4	14.38	83.42	2.68
		Under 100 Acres.		
B. 40105	39.5	14.81	83.65	3.90
B. 43413	36.3	13.83	83.00	3.83
B. 37161	73.5	14.68	84.93	3.70
B. 41227	14.0	13.79	83.00	3.21
D. 14/34	15.4	13.34	83.12	2.21

* Undue importance should not be attached to the order of merit when only a small acreage has been harvested.

TABLE I (B).—**Weighted Mean Commercial Yields in West Demerara, 1955.**

Variety.	Acres Harvested.	Crusher Juice. Pol. %	Crusher Juice. Purity.	Tons 96° Sugar per Acre*.
Plant Canes. 100 Acres and over.				
B. 4098	133.2	14.12	82.74	4.88
B. 4362	426.5	14.66	83.36	4.83
B. 37161	1,412.3	14.59	84.30	4.50
B. 47225	217.2	15.77	86.60	4.17
B. 41227	210.4	14.42	83.18	4.16
Under 100 Acres.				
P.O.J. 3016	1.2	15.44	85.87	7.33
B. 4744	9.0	13.38	81.10	6.11
Eros	5.0	15.08	84.34	5.32
B. 46378	9.5	14.70	82.94	4.03
Comus	1.2	15.37	85.25	4.00
Mixed	28.3	13.98	82.10	3.93
B. 47258	5.2	12.39	78.96	2.90
M. 112/34	6.5	13.97	81.92	2.83
P.O.J. 2967	3.7	15.44	84.93	2.81
M. 134/32	11.7	12.78	79.88	2.20
First Ratoons. 100 Acres and over.				
B. 4362	460.0	15.46	84.07	4.25
B. 37161	983.9	14.62	83.73	3.90
B. 4098	391.9	15.37	85.44	3.70
B. 41227	728.0	14.66	83.84	3.49
Under 100 Acres.				
B. 46369	3.2	14.81	83.16	4.50
B. 40105	6.5	14.67	82.65	4.00
B. 47262	3.2	14.67	82.65	3.87
B. 43253	4.5	15.00	81.97	3.56
B. 47379	1.2	15.83	85.94	3.33
Mixed	43.8	14.56	84.03	3.26
B. 49380	3.5	15.06	83.25	3.20
D. 37/45	25.1	14.62	82.73	3.02
B. 46151	3.7	15.73	84.57	2.92
B. 4788	3.5	15.01	83.48	2.89
B. 4764	4.7	14.08	82.30	2.64
Pinder	1.2	15.54	84.84	2.50
B. 46378	5.5	14.97	83.90	2.45
B. 4765	4.5	14.67	82.65	2.33
Seedlings	6.5	14.67	82.65	1.43
Second Ratoons. 100 Acres and over.				
B. 37161	1,300.0	15.10	85.02	3.13
B. 41227	1,291.5	14.76	84.15	2.80
B. 4098	586.5	15.24	85.32	2.61
Under 100 Acres.				
B. 4362	61.8	15.57	84.81	3.65
B. 43253	15.2	14.90	84.47	3.00
D. 62/43	48.4	14.69	84.03	2.78
B. 47379	1.8	16.25	85.08	2.67
Co. 419	10.2	16.02	86.48	2.57
Mixed	10.0	14.69	84.55	2.48
B. 46378	10.0	13.78	82.17	2.35
B. 46369	3.2	12.35	79.68	2.12
B. 47262	3.2	12.39	78.96	2.09
B. 4788	3.5	11.68	78.65	1.91
B. 49380	3.5	11.86	78.03	1.89
B. 4764	4.7	12.39	78.96	1.87
B. 40105	6.5	12.25	79.03	1.71
B. 46151	3.7	12.39	78.96	1.65
B. 4765	4.5	12.10	79.31	1.62
Seedlings	6.5	12.39	78.96	1.37
Third Ratoons. 100 Acres and over.				
B. 37161	634.6	14.85	84.44	3.10
B. 41227	586.1	14.63	84.01	2.86
B. 34104	123.5	14.81	84.62	2.79
Under 100 Acres.				
B. 4362	11.8	15.95	85.14	3.17
B. 4098	91.4	14.38	82.81	2.85
B. 43253	4.0	15.38	85.92	2.40
Mixed	16.2	14.60	84.24	2.35
D. 62/43	35.7	15.27	85.82	2.32
Old Ratoons. 100 Acres and over.				
B. 41227	145.4	14.87	83.76	3.20
B. 34104	579.7	14.76	85.12	2.67
Under 100 Acres.				
Co. 419	10.5	14.92	83.46	2.95
B. 37161	86.3	14.93	84.38	2.84
B. 4098	9.5	15.16	84.27	2.79
D. 142/41	51.7	14.90	83.73	2.78
D. 14/34	45.0	15.91	86.14	2.68
D. 62/43	3.5	15.47	86.42	2.06
Mixed	5.2	14.71	80.82	1.77

*Undue importance should not be attached to the order of merit when only a small acreage has been harvested.

TABLE 1 (C).—**Weighted Mean Commercial Yields along Demerara River Banks, 1955.**

Variety.	Acres Harvested.	Crusher Juice. Pol. %	Crusher Juice. Purity.	Tons 96° Sugar per Acre.*
		Plant Canes.		
		100 Acres and Over.		
B. 37161	2,072.4	13.77	82.45	4.30
B. 41227	705.1	13.25	80.98	4.29
B. 4362	252.2	14.76	83.66	4.07
B. 47225	113.4	14.35	83.58	4.04
B. 4098	485.3	14.37	83.35	3.92
D. 37/45	127.5	13.65	81.83	3.27
		Under 100 Acres.		
B. 47419	1.6	13.08	79.76	6.31
B. 4373	.2	12.43	80.19	5.00
Pindar	1.4	15.03	84.44	4.36
Comus	.7	14.80	85.16	4.29
Mixed	1.2	15.53	86.91	4.25
D. 142/41	47.3	13.35	81.94	4.22
B. 46378	60.5	13.24	81.29	3.95
B. 47258	22.8	14.18	82.23	3.86
D. 158/41	24.7	13.73	82.34	3.67
Co. 419	.6	13.16	80.74	3.33
D. 14/34	10.0	12.48	80.50	3.30
Eros	3.1	14.82	84.20	2.94
		First Ratoons.		
		100 Acres and Over		
Co. 419	173.5	14.31	83.95	4.24
B. 41227	1,589.0	14.26	83.37	3.96
B. 37161	1,155.6	14.18	82.88	3.87
B. 4098	390.9	14.58	83.66	3.78
B. 4362	451.0	14.51	83.18	3.51
B. 34104	115.7	14.23	82.56	3.48
		Under 100 Acres.		
B. 47258	.4	14.78	83.28	5.00
B. 47419	.6	14.41	82.13	5.00
D. 158/41	18.7	14.24	84.16	3.80
D. 37/45	54.2	14.63	83.35	3.77
B. 46378	16.4	13.70	82.74	3.71
Mixed	2.0	11.80	83.69	3.60
D. 142/41	57.9	13.85	82.19	3.56
B. 47225	1.0	13.07	82.02	3.40
B. 4373	.3	15.05	83.61	3.33
		Second Ratoons.		
		100 Acres and over.		
B. 37161	988.3	14.30	83.27	3.33
B. 41227	1,842.4	14.19	82.94	3.18
B. 4362	120.8	15.16	84.16	3.02
Co. 419	230.6	14.22	82.50	2.91
D. 142/41	167.8	14.29	83.62	2.80
B. 34104	275.2	14.11	82.56	2.77
B. 4098	289.9	14.58	83.59	2.56
		Under 100 Acres.		
D. 37/45	3.7	14.23	82.12	4.43
B. 40105	.5	15.21	84.03	4.00
Mixed	10.0	15.90	85.00	3.70
D. 62/43	33.6	14.26	83.90	3.24
B. 46378	2.0	14.60	82.98	3.10
D. 14/34	31.1	14.06	81.76	2.74
D. 49/41	17.5	13.91	82.56	2.67
D. 158/41	53.2	13.54	81.55	2.62
Diamond 10	10.5	14.01	83.48	2.57
		Third Ratoons.		
		100 Acres and Over.		
Co. 419	232.3	13.66	80.91	3.52
B. 41227	1,194.5	14.15	83.48	3.28
B. 34104	191.8	14.31	83.23	2.97
B. 37161	557.7	14.76	84.05	2.88
B. 4098	309.0	13.81	82.41	2.44
		Under 100 Acres.		
D. 62/43	17.2	14.81	85.01	3.49
D. 158/41	9.7	14.20	83.57	3.04
B. 4362	69.5	14.76	84.43	2.96
D. 49/41	3.0	13.62	83.08	2.90
D. 14/34	22.5	14.85	83.11	2.88
D. 142/41	33.9	14.15	84.47	2.82
		Old Ratoons.		
		100 Acres and Over.		
B. 37161	1,087.3	14.02	83.34	3.36
B. 41227	276.5	13.92	83.16	3.30
B. 34104	913.8	14.09	83.14	2.81
		Under 100 Acres.		
D. 142/41	22.5	13.66	82.43	3.31
D. 14/34	34.0	14.67	85.55	2.88
B. 4098	5.5	17.43	83.80	2.73
B. 4362	5.5	17.43	83.80	2.73
D. 49/41	6.5	15.45	83.67	2.68

*Undue importance should not be attached to the order of merit when only a small acreage has been harvested.

TABLE I (D).—Weighted Mean Commercial Yields in Berbice, 1955.

Variety.	Acres Harvested.	Crusher Juice. Pol. %	Purity.	Tons 96° Sugar per Acre.*
Plant Canes. 100 Acres and over.				
B. 4362	292.0	14.59	82.40	4.19
B. 37161	3,191.9	14.48	83.33	4.15
B. 41227	2,327.0	14.27	82.84	3.98
B. 4098	646.5	14.69	83.70	3.64
Under 100 Acres.				
D. 19/46	2.0	12.85	80.61	4.8
D. 18/46	2.0	11.36	77.38	4.15
B. 4724	2.0	12.53	80.32	4.5
D. 158/41	38.0	14.87	82.20	4.39
B. 40105	7.1	13.79	80.64	4.1
Mixed	15.7	14.47	83.76	3.8
D. 37/45	8.8	14.18	84.68	3.77
B. 47225	95.5	14.66	82.80	3.65
B. 46378	23.4	14.22	82.71	3.58
B. 43253	2.5	14.32	82.50	3.52
B. 4733	1.1	13.66	81.75	3.36
B. 4373	8.0	15.31	83.69	3.22
Seedlings	25.2	14.47	83.35	3.00
D. 62/43	60.2	14.03	83.56	2.55
D. 43413	1.7	15.16	84.46	2.35
First Ratoons. 500 Acres and over.				
D. 62/43	120.7	14.64	83.60	3.90
B. 37161	1,097.4	14.31	83.45	3.79
B. 4098	1,248.3	14.80	82.77	3.57
B. 41227	3,813.4	14.75	83.31	3.54
D. 37/45	108.4	14.05	82.75	3.33
B. 34104	443.0	13.71	82.16	2.83
Under 100 Acres.				
B. 40105	4.4	14.03	81.81	4.09
Mixed	23.0	14.61	83.54	3.67
B. 4362	28.7	14.55	83.01	3.59
D. 158/41	62.1	15.18	84.42	3.54
B. 46378	2.5	14.43	83.15	3.28
D. 14/34	24.9	14.71	86.54	2.22
Second Ratoons. 100 Acres and over.				
B. 37161	1,112.7	14.02	82.81	3.45
B. 41227	2,178.7	14.28	82.83	3.32
B. 4098	1,771.7	14.67	83.22	3.21
Co. 419	146.2	13.79	77.78	2.04
B. 34104	1,305.5	15.06	84.44	2.83
D. 14/34	142.4	15.22	85.49	1.80
Under 100 Acres.				
B. 46378	.6	17.05	86.99	5.00
D. 37/45	10.5	14.79	83.40	3.85
Mixed	33.9	14.77	84.44	3.11
D. 62/43	40.1	15.72	85.46	2.96
B. 4362	16.3	14.39	82.14	2.82
D. 158/41	58.5	16.21	84.98	2.69
B. 40105	.6	13.64	81.19	1.66
Third Ratoons. 100 Acres and over.				
B. 37161	1,082.4	14.45	83.63	3.40
B. 41227	2,950.1	14.81	83.37	3.10
B. 4098	339.9	15.57	84.13	3.08
B. 34104	1,343.7	15.23	84.52	2.64
D. 14/34	298.1	15.31	85.83	2.36
Under 100 Acres.				
D. 37/45	1.2	14.02	82.47	4.17
Co. 419	3.3	13.47	82.13	3.33
D. 62/43	15.2	14.10	83.25	3.02
Mixed	11.2	14.48	82.44	2.98
D. 158/41	73.9	15.59	84.57	2.86
D. 142/41	90.2	14.69	84.34	2.50
P.O.J. 2878	16.2	15.49	85.52	2.31
B. 4362	11.0	13.31	82.18	2.05
Old Ratoons. 100 Acres and over.				
B. 37161	102.9	14.52	83.06	4.15
B. 4098	160.0	14.26	83.09	3.26
B. 41227	230.2	15.41	84.05	2.95
B. 34104	1,046.4	14.97	83.97	2.85
Under 100 Acres.				
Mixed	9.5	15.00	84.29	3.34
D. 142/41	89.7	14.30	82.64	2.79
D. 49/41	9.3	16.18	84.11	2.65
Co. 419	57.4	14.52	83.30	2.00
B. 37172	3.0	16.02	86.59	1.33

*Undue importance should not be attached to the order of merit when only a small acreage has been harvested.

TABLE I (E).—**Weighted Mean Commercial Yields under Estate Conditions, 1955.**

Variety.	Acres Harvested.	Crusher Juice. Pol. %	Crusher Juice. Purity.	Tons 96° Sugar Per Acre.*
		Plant Canes. 100 Acres and over.		
B. 37161	3,516.9	14.16	83.06	4.17
B. 4362	1,665.4	14.48	82.94	4.12
B. 41227	1,576.6	13.90	82.27	4.03
B. 47225	373.7	14.39	83.11	3.99
B. 4098	1,288.0	14.41	83.26	3.98
B. 46378	114.1	14.12	82.46	3.84
D. 37/45	145.6	13.73	82.84	3.29
B. 40105	101.2	14.02	82.08	3.24
		Under 100 Acres.		
P.O.J. 3016	1.2	15.44	85.87	7.33
B. 47419	1.6	13.08	79.76	6.31
B. 4744	9.0	13.38	81.10	6.11
D. 19/46	2.0	12.85	80.61	4.80
D. 18/46	2.0	11.36	77.38	4.70
B. 4724	2.0	12.53	80.32	4.55
Eros	8.1	14.95	84.27	4.41
D. 142/41	47.3	13.35	81.94	4.22
D. 158/41	62.7	14.11	82.30	4.11
Comus	1.9	15.08	85.20	4.11
Pindar	7.5	14.60	84.13	4.01
Mixed	45.2	14.48	83.73	3.92
B. 47258	28.0	13.28	80.59	3.68
B. 4373	20.0	13.86	82.32	3.65
B. 47379	3.4	14.15	84.27	3.53
B. 43253	2.8	13.92	83.78	3.50
B. 4733	1.1	13.66	81.75	3.36
D. 14/34	10.0	12.48	80.50	3.30
Seedlings	25.2	14.47	83.35	3.00
Co. 419	21.3	13.24	81.62	2.91
M. 112/34	6.5	13.97	81.92	2.83
P.O.J. 2967	3.7	15.44	84.93	2.81
D. 62/43	60.2	14.03	83.56	2.53
B. 43413	1.7	15.16	84.46	2.35
M. 134/32	11.7	12.78	79.88	2.20
		First Ratoons. 100 Acres and over.		
Co. 419	224.0	13.93	83.32	4.07
D. 62/43	120.7	14.64	83.60	3.90
B. 37161	3,589.9	14.28	83.25	3.84
B. 4362	1,248.9	14.57	83.06	3.69
B. 4098	2,445.6	14.68	83.88	3.63
B. 41227	7,901.5	14.43	83.23	3.59
D. 37/45	198.7	14.25	82.81	3.46
B. 34104	685.8	13.99	82.74	3.29
		Under 100 Acres.		
B. 46369	3.2	14.81	83.16	4.50
B. 47262	5.2	14.67	82.65	3.87
B. 40105	22.4	14.48	83.04	3.84
B. 47419	1.6	14.04	82.12	3.75
D. 158/41	8.8	14.87	84.34	3.60
B. 43253	4.5	15.00	81.97	3.56
D. 142/41	57.9	13.85	82.19	3.56
Mixed	68.8	14.25	83.68	3.41
B. 47258	.4	14.78	83.28	3.40
B. 47225	1.0	13.07	82.02	3.40
B. 43413	20.0	13.44	82.20	3.40
B. 46378	24.4	14.23	83.14	3.39
B. 4373	.3	15.05	83.61	3.33
B. 47379	1.2	15.83	85.94	3.33
B. 49380	3.5	15.06	83.25	3.20
B. 4744	1.0	13.68	82.12	3.00
B. 46151	3.7	15.73	84.57	2.92
B. 4788	3.5	15.01	83.43	2.89
B. 4764	4.7	14.08	82.30	2.64
Pindar	1.2	15.54	84.84	2.50
B. 44341	15.3	13.74	84.79	2.46
B. 4765	4.5	14.67	82.65	2.33
D. 14/34	24.9	14.71	86.54	2.22
Seedlings	7.5	14.50	83.50	1.91
		Second Ratoons. 100 Acres and over.		
B. 40105	498.1	13.96	82.28	3.42
B. 37161	4,745.6	14.31	83.30	3.26
B. 4362	254.9	14.74	83.19	3.21
B. 41227	6,164.6	14.27	83.01	3.12
B. 4098	2,755.9	14.47	83.51	3.01
Co. 419	441.0	14.42	83.02	3.00
D. 62/43	140.4	14.55	83.89	2.97
D. 142/41	167.8	14.29	83.62	2.80
D. 158/41	137.7	14.16	82.46	2.69
B. 34104	2,693.9	14.58	83.52	2.66
D. 14/34	173.5	14.84	84.25	1.97
		Under 100 Acres.		
D. 37/45	14.2	14.57	82.89	4.00
B. 43253	15.2	14.90	84.47	3.00
Mixed	82.6	14.91	84.56	2.97
B. 47379	1.8	16.25	85.05	2.67
D. 49/41	17.5	13.91	82.56	2.67
B. 46378	12.6	15.14	84.05	2.60
Diamond 10	10.5	14.01	83.48	2.57
B. 46369	3.2	12.35	79.68	2.12
B. 47262	3.2	12.39	78.93	2.09
B. 4788	3.5	11.68	78.65	1.91
B. 49380	3.5	11.86	78.03	1.86
B. 4764	4.7	12.39	78.96	1.87
B. 46151	3.7	12.39	78.96	1.65
B. 4765	4.5	12.10	79.31	1.62
Seedlings	6.5	12.39	78.96	1.37
		Third Ratoons. 100 Acres and over.		
Co. 419	244.8	13.97	83.18	3.54
B. 40105	437.4	14.72	84.06	3.23
B. 37161	2,804.5	14.52	83.71	3.14
B. 41227	5,309.6	14.44	83.33	3.12
B. 4098	742.3	14.76	83.55	3.06
D. 142/41	124.1	14.46	84.40	2.59
B. 34104	3,520.1	14.77	84.72	2.51
D. 14/34	320.6	15.11	84.66	2.39
		Under 100 Acres.		
B. 46378	.2	14.13	82.92	5.00
D. 37/45	1.2	14.02	82.47	4.17
D. 49/41	3.0	13.62	83.08	2.94
D. 4362	92.6	14.57	83.67	2.88
D. 158/41	95.8	14.71	83.76	2.84
D. 62/43	72.6	14.36	84.02	2.75
Mixed	27.4	14.53	83.16	2.61
B. 43253	4.0	15.38	85.92	2.40
P.O.J. 2878	21.9	15.08	84.87	2.21
		Old Ratoons. 100 Acres and over.		
B. 37161	1,350.0	14.51	83.71	3.40
B. 4098	175.0	14.84	83.96	3.22
B. 41227	666.1	14.94	83.77	3.15
D. 142/41	163.9	14.21	82.83	2.86
B. 34104	2,672.3	14.56	83.85	2.79
		Under 100 Acres.		
B. 40105	39.5	14.81	83.65	3.00
B. 40102	36.3	13.83	83.00	3.83
Mixed	14.7	14.85	82.55	2.78
B. 4362	5.5	17.43	83.80	2.73
D. 49/41	15.8	15.45	83.67	2.68
D. 14/34	94.4	14.64	84.94	2.67
Co. 419	67.9	14.72	83.38	2.15
D. 62/43	3.5	15.17	86.42	2.06
B. 37172	3.0	16.02	86.59	1.33

*Undue importance should not be attached to the order of merit when only a small acreage has been harvested.

THE VARIETY AND FERTILIZER POSITION OF THE SUGAR INDUSTRY, XXI.

BY

L. S. BIRKETT, *Sugar Agronomist.*

1. *Commercial Yields, 1955.* The average yield in 1955, of tons commercial sugar per acre from all varieties on the sugar estates in British Guiana was 3.40 tons as compared with 3.14 tons in 1954 and 3.47 tons per acre in 1953. The yields of the various varieties on the individual estates are presented in Table I which is drawn up on the usual regional basis.

The data in Table I are summarised for the major cane varieties in Table II.

TABLE II.—**Weighted Average Yields for the Major Cane Varieties, 1955.**

Cane Variety.	Average Yield, Tons Sugar per Acre, 1955.					Crusher Juice.	
	Plants.	1 R.	2 R.	3 R.	Old R.	Pol. %.	Purity.
B.37161	4.17	3.84	3.26	3.14	3.40	14.35	83.39
B.41227	4.03	3.59	3.22	3.12	3.15	14.41	83.21
B.4362	4.12	3.69	3.21	2.88	2.73	15.16	83.33
B.40105	3.24	3.84	3.42	3.23	3.90	14.40	83.02
B.4098	3.88	3.63	3.01	3.06	3.22	14.63	83.51
Co. 419	2.91	4.07	3.00	3.54	2.15	14.06	82.88
D.158/41	4.11	3.60	2.84	2.69	—	14.46	83.22
D.142/41	4.22	3.56	2.80	2.59	2.86	14.03	83.00
B.46378	3.84	3.39	2.68	—	—	14.40	83.14
D.14/34	3.30	2.22	1.97	2.39	2.67	14.36	84.18
B.34104	—	3.29	2.66	2.51	2.79	14.47	83.53
Colony Averages. (All Varieties).	4.07	3.65	3.06	2.95	3.01	14.43	83.30

2. *Varietal Composition of the 1955 Harvests.* The variety position for 1955 on a regional basis has been abstracted from returns supplied by the sugar estates and refers only to estate grown canes from which approximately 98% of the sugar production of the Colony is manufactured. These data are summarised in Table III. The acreage occupied by the varieties which constitute the "other canes" category is given in Table IV.

TABLE III.—**Acreage and Percentage Distribution of the Varieties Reaped in 1955.**

Variety.	English Acres.	Percentage Distribution.				
		In West Demerara.	Along Demerara River Banks.	In East Demerara.	Berbice.	Colony.
B. 41227	**24,618.4**	**12.0**	**22.8**	**18.5**	**16.7**	**34.3**
B. 37161	21,250.9	20.8	27.6	20.6	31.0	29.6
B. 34104	9,572.1	7.3	15.6	33.9	43.2	13.3
B. 4098	7,406.8	16.4	20.0	7.3	56.3	10.3
B. 4362	3,255.3	29.5	27.6	32.2	10.7	4.5
B. 40105	1,098.6	1.2	—	97.7	1.1	1.5
Co. 419	999.0	2.1	63.8	13.4	20.7	1.4
D. 14/34	623.4	7.2	15.7	2.4	74.7	.9
B. 47225	574.7	37.9	19.9	25.6	16.6	.8
D. 142/41	561.0	9.2	58.7	—	32.1	.8
D. 62/43	397.4	22.0	12.8	5.8	59.4	.6
D. 158/41	377.0	—	28.2	10.1	61.7	.5
D. 37/45	359.7	7.0	51.5	5.7	35.8	.5
Other Varieties	770.5	32.6	22.1	19.8	25.5	1.0
Totals	71,864.8					100.0

TABLE IV.—**Acreages of the Varieties Constituting the "Other Canes" Category.**

Variety.	English Acres.		Variety.	English Acres.		Variety.	English Acres.	
	1955.	1956.		1955.	1956.		1955.	1956.
P.O.J. 2878	26	3	B. 40102	52	125	B. 4744	18	19
P.O.J. 2967	2	30	B. 4373	32	205	B. 47419	3	82
P.O.J. 3016	1	6	B. 43253	24	28	B. 48372	—	29
Co. 413	—	1	B. 43413	23	23	N.C.O. 310	—	56
Co. 421	15	36	B. 4448	3	3	N.C.O. 330	—	3
Comus	15	9	B. 4466	4	4	H. 37—1933	—	47
Diamond 10	11	11	B. 44111	2	2	M. 134/32	—	23
Eros	2	104	B. 44244	2	2	M. 112/34	—	19
D. 14/34	—	124	B. 44341	18	18	M. 213/40	—	5
D. 49/41	31	14	B. 45137	—	2	M. 423/41	—	3
D. 142/41	—	264	B. 46218	—	5	P.R. 1000	—	2
D. 158/41	—	246	B. 4724	2	2	Trojan	—	14
D. 18/46	2	2	B. 4733	1	1	Pepecuca	—	1
D. 19/46	2	2				Mixed Varieties	275	322

It will be noted that the acreage in B.34104 has dropped from 23,137.8 acres in 1954 to 9,572.1 acres in 1955.

B.41227 was the major commercial variety in 1955, the acreage reaped having increased from 21,588.2 acres in 1954 to 24,618.4 acres in 1955. B.37161 which is the second major variety increased in acreage from 14,175.2 acres in 1954 to 21,250.9 acres in 1955. Of the other varieties, the acreages in B.4098 and B.4362 shewed slight increases over those of the previous year but these two varieties have probably now reached their peak. Of the newer varieties. B.47225 has come into sudden prominence.

3. *Acreages in the Various Varieties Scheduled for Reaping in 1956.*

The acreages in the various varieties which are scheduled for reaping in 1956 are given in Table V.

TABLE V.—**Percentage Distribution of the Varieties to be Reaped in 1956.**

Variety.	Total English Acres in the Respective Cane Varieties.	Percentage Distribution.				
		In West Demerara.	Along Demerara River Banks.	In East Demerara.	In Berbice.	Colony.
B. 37161	30,936.6	17.5	29.4	16.1	37.0	39.9
B. 41227	24,096.7	11.5	20.1	21.6	46.8	31.1
B. 4098	5,999.7	14.0	16.7	9.0	60.3	7.7
B. 47225	3,606.4	33.2	10.8	26.9	29.1	4.7
B. 4362	3,513.1	28.2	27.9	33.9	10.0	4.5
B. 34104	2,205.7	.8	46.9	14.7	31.3	2.9
Pindar	1,223.7	5.2	5.5	48.9	40.4	1.6
Co. 419	1,094.1	.9	63.9	11.5	23.7	1.4
B. 47258	675.1	21.5	37.3	21.4	19.8	.9
B. 40105	631.2	—	.1	97.8	2.1	.8
B. 46378	506.4	14.9	63.0	8.8	13.3	.7
D. 37/45	418.0	7.1	46.9	14.7	31.3	.5
B. 47379	417.7	17.8	.9	77.5	3.8	.5
D. 62/43	276.6	15.7	3.3	8.0	73.0	.4
Other Canes	1,894.6	16.2	23.6	27.5	32.7	2.4
Totals	77,495.6					100.0

TABLE VI.—Summary of the Percentage of the Acreage under the Major Cane Varieties, 1945—1956.

Variety.	Per cent. of Total Areas in the Colony.											
	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
P.O.J. 2878	54.8	40.4	27.6	13.6	6.9	1.6	0.4	—	—	—	—	—
Diamond 10	26.7	25.4	21.6	14.4	8.4	3.1	0.9	0.4	—	—	—	—
D. 166/34	2.2	1.6	1.0	0.5	—	—	—	—	—	—	—	—
Co. 419	4.9	6.5	7.7	8.2	6.8	4.5	2.7	1.7	1.4	1.5	1.4	1.4
Co. 421	6.3	15.1	19.4	19.3	14.2	8.5	3.5	2.1	0.8	—	—	0.1
D. 14/34	2.7	6.4	11.3	17.4	20.6	20.2	15.0	8.6	4.9	2.5	0.8	0.2
B. 34104	—	1.6	7.6	22.6	39.8	58.4	67.4	60.2	47.7	31.0	13.2	2.9
D. 200/36	—	—	1.5	1.9	1.7	0.7	—	—	—	—	—	—
B. 4098	—	—	—	—	—	—	—	1.3	4.6	9.2	9.9	7.7
B. 37161	—	—	—	—	—	1.4	3.6	9.4	14.4	18.9	30.3	39.9
B. 40105	—	—	—	—	—	—	—	0.5	0.7	0.8	1.6	0.8
B. 41227	—	—	—	—	—	0.3	3.8	12.7	21.7	30.5	33.6	31.1
D. 142/41	—	—	—	—	—	0.2	1.4	1.6	1.6	1.3	0.8	0.3
D. 158/41	—	—	—	—	—	—	—	0.3	0.4	0.5	0.5	0.3
D. 62/43	—	—	—	—	—	—	—	—	0.3	0.4	0.5	0.4
B. 4362	—	—	—	—	—	—	—	—	0.5	2.0	4.4	4.5
D. 37/45	—	—	—	—	—	—	—	—	—	0.3	0.5	0.5
B. 46378	—	—	—	—	—	—	—	—	—	—	0.3	0.7
B. 47225	—	—	—	—	—	—	—	—	—	—	1.3	4.7
B. 47258	—	—	—	—	—	—	—	—	—	—	—	0.9
B. 47379	—	—	—	—	—	—	—	—	—	—	—	0.5
Pindar	—	—	—	—	—	—	—	—	—	—	—	1.6
Other Canes	2.4	3.0	2.3	2.1	1.6	1.1	1.3	1.2	1.0	1.1	0.9	1.5

It will be observed from this Table that B.47225 now occupies fourth position in acreage. Pindar is another variety that has become very popular with estates managements, over 1,000 acres being scheduled for reaping in 1956. The acreages in B.47258 and B.46378 have also increased. From tests conducted by the Staff of the Sugar Experiment Station, B.47258 holds the most promise amongst these four newer varieties of becoming a major commercial variety in British Guiana.

It should be noted that B.37161 will be the major variety for reaping in 1956 while the acreage in B.41227 shews no increase over that of 1955.

4. *The Changing Variety Pattern.* In Table VI is presented a summary of the percentage of the acreage under the various cane varieties in the Colony over the period 1945-1956.

5. *Cycle Age of Crops.* Table VII summarises the distribution of the acreage under cane in plants and the various categories of ratoons for the period 1947-1956.

TABLE VII.—**Cycle Age of the Crops.**

Category.	Percentages.									
	1947.	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.	1956.
Plants	28.4	31.3	31.2	33.1	28.8	27.8	26.1	25.0	26.1	27.9
1st Ratoons	27.0	26.1	26.5	27.4	28.2	23.4	23.9	25.1	23.9	24.5
2nd Ratoons	22.3	24.5	24.8	23.3	24.4	23.7	22.4	23.0	24.1	23.3
3rd Ratoons	11.8	14.3	15.2	12.6	15.1	18.8	18.2	17.8	18.6	17.1
4th Ratoons	7.0	2.5	2.0	3.1	3.0	5.4	8.5	7.4	5.0	5.1
5th Ratoons	3.5	1.3	.3	.5	.5	.9	.9	1.7	2.3	2.1
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

6. *Fertilizers.* The quantities of, and expenditure on, the various fertilizers used on the sugar estates in British Guiana for the years 1953, 1954 and 1955 are presented in Table VIII.

The widespread adoption of the foliar diagnosis technique, by affording a means of determining the specific nutrient deficiencies of the various areas on the sugar estates, has necessarily led to attempts to supply any deficiency in the major nutrients where it is profitable to do so. This in turn has led to an increase in the rate of application of non-nitrogenous fertilizers.

Reference to Table VIII discloses that there have been appreciable increases in the quantities of phosphate and potassic fertilizers and limestone applied in 1955.

ies of Fertilizers used on Sugar Estates, 1953 - 1955.

Hyperphosphate.			Muriate of Potash.			Sulphate of Potash.			Limestone.			Urea.		
1954.	1955.		1953.	1954.	1955.	1953.	1954.	1955.	1953.	1954.	1955.	1953.	1954.	1955.
414	1,017		4	300	645	3	233	393	5,971	7,877	14,552	—	—	33
35,219	88,193		470	34,762	74,631	391	27,727	45,720	135,510	182,856	315,652	—	—	8,562
85.10	86.75		117.50	116.04	115.74	130.33	118.79	116.29	22.70	23.22	21.69	—	—	255.95
1.7	3.0		—	1.2	1.9	—	.9	1.2	30.4	31.6	43.1	—	—	0.1
1.6	3.2		—	1.5	2.7	—	1.2	1.7	7.5	8.1	11.6	—	—	0.3

TABLE VIII.—Values and Quantit

	Ammonium Sulphate.			Basic Slag.			Superphosphate.			
	1953.	1954.	1955.	1953.	1954.	1955.	1953.	1954.	1955.	1953.
Quantity—Tons	13,236	14,244	14,212	35	7	67	11	1,885	2,876	40
Value—$	1,634,436	1,686,106	1,708,630	2,275	547	1,600	2,365	302,412	478,676	34,89
Cost per Ton—$	123.48	118.37	120.22	64.43	77.39	24.00	197.90	160.46	166.43	85.5
% of Total Quantity	67.3	57.1	42.0	0.2	—	0.2	—	7.5	8.5	2.
% of Total Value	90.3	74.3	62.8	0.2	—	0.1	0.1	13.3	17.6	1.

REPORT ON THE SUGAR EXPERIMENT STATIONS FOR THE YEAR 1955.

SUGAR EXPERIMENT STATIONS' COMMITTEE.

The following members formed the British Guiana Sugar Experiment Stations' Committee for the year :—

The Director of Agriculture	.....	*Chairman*
Mr. R. R. Follett-Smith	.....	*Messrs. Bookers Sugar Estates, Ltd.*
Dr. H. Evans		*Messrs. Bookers Sugar Estates, Ltd.*
Mr. G. M. Eccles		*Messrs. S. Davson & Co., Ltd.*
Mr. J. Baxter		*Messrs. Bookers Sugar Estates, Ltd.*
Mr. A. G. Harley		*Messrs. Sandbach Parker & Co., Ltd.*
Mr. S. A. Angoy		*Secretary.*

RESEARCH SUB-COMMITTEE.

The personnel of the British Guiana Sugar Experiment Stations' Research Sub-Committee for 1955 was as follows :—

The Director of Agriculture	*Chairman*
Dr. H. Evans	*Messrs. Bookers Sugar Estates, Ltd.*
Mr. A. G. Harley	*Messrs. Sandbach Parker & Co., Ltd.*
Mr. J. S. Edwards	*Messrs. S. Davson & Co., Ltd.*
Mr. R. O. Williams	*Chief Research Officer, Department of Agriculture.*
Mr. L. S. Birkett	*Sugar Agronomist.*
Mr. J. A. Pires	*Plant Pathologist, Department of Agriculture.*

STAFF OF SUGAR EXPERIMENT STATIONS.

L. S. Birkett, Dip. Agric. (I.C.T.A.), A.I.C.T.A:	*Sugar Agronomist.*
C. Cameron	*Field Manager.*
H. I. Gomes	*Field Assistant.*
S. L. Cameron	*Field Assistant (to April).*
R. Dookun	*Field Assistant.*
S. Phillippe	*Field Assistant (to February).*
H. Naraine	*Field Assistant (from March).*
N. Bayne	*Field Assistant (from June to October).*
K. Johnson	*Field Assistant (from November).*
K. Chung	*Statistical Assistant.*
S. Mangra	*Laboratory Assistant.*
S. Buchanan	*Typist.*

Personnel Changes, Leave, etc.

Mr. S. Phillippe resigned as Fourth Field Assistant to take up an appointment as overseer at Pln. Port Mourant.

Mr. S. Cameron resigned as Second Field Assistant to take up an appointment as overseer at Pln. Diamond.

Following Mr. Cameron's resignation Mr. R. Dookun was promoted Second Field Assistant.

Mr. H. Naraine was employed as a Field Assistant on the 1st March.

Mr. N. Bayne was employed as a Field Assistant from the 15th June.

Mr. N. Bayne resigned his Post as a Field Assistant on the 31st October.

Mr. K. Johnson was employed as a Field Assistant on the 1st November.

Absences of the Staff from duty during the year were as follows :—

	Casual Leave.	Sick Leave.	Vacation Leave.
Mr. C. Cameron	8.12.55—22.12.55	2. 5.55—15. 5.55	—
Mr. H. Gomes	—	—	3. 6.55—31. 8.55
Mr. S. Cameron	—	—	1. 2.55—30. 4.55
Mr. R. Dookun	23.12.55—14. 1.56	—	—
Mr. K. Chung	29.12.55—13. 1.56	—	—
Mr. S. Mangra	—	21.11.55— 3.12.55	—
Miss S. Buchanan	1.12.55—17.12.55	19. 8.55—29. 8.55	—

EXPERIMENTS.

The results of the experiments reaped during the year have been fully reported elsewhere in this Bulletin. They consisted of seventy-six variety trials, (including eight sorting trials), nine fertilizer trials, one cultivation *cum* variety trial, and three experiments on the growth and ripening characteristics of four type varieties, a total of eighty-nine experiments.

SEEDLINGS INTRODUCED, ETC.

Cane Varieties received during the year from the Central Cane Breeding Station, Barbados, were as follows: B.42231, B.46364, B.5321, B.5352, B.5398, B.53122, B.53165, B.53200, B.53218, B.53227, B.53261, B.53267, B.53317, B.53320, B.53329, B.53348, B.53355, B.53362, B.53365.

Those received from the Plant Quarantine Station, Trinidad were: Q.47, Q.50, Q.56, Q.57, C.P.34—79, C.P.34—120, C.P:36—105, C:P:36—111, C.P.44—101, C.P.44—154, F.31—436, F.31—962, P.R.902.

In addition, "fuzz" was received from the Central Cane Breeding Station, Barbados, from which 2,982 seedlings were raised. Selections for field trials will be made in due course from the more promising of these seedlings.

Mr. G. C. Stevenson, Senior Geneticist, B. W. I. Central Cane Breeding Station, visited the Station in April, 1955, and assisted the staff of the Station in the selection of seedlings raised from the Barbados fuzz forwarded in 1953. Forty-two of these seedlings have been selected for placing in sorting trials and are being multiplied for this purpose. These seedlings carry the designation D.B.

During the year, one hundred and sixty-seven Demerara seedlings were obtained from crosses made at the Station. Selections therefrom will be made for field trials in due course.

The position in respect to varieties under test and undergoing multiplication in 1955 is presented in Table I.

Varieties under Test and Undergoing Multiplication Etc., at December 31st, 1955.

Year.	Barbados.		Demerara.		Other Countries.	
	In Test.	Under Multiplication.	In Test.	Under Multiplication.	In Test.	Under Multiplication.
Prior to 1940	—	—	—	1	6	35
1940	2	—	—	—	1	—
1941	—	—	1	—	1	—
1942	1	1	—	—	—	—
1943	6	3	4	—	—	—
1944	2	2	1	—	—	—
1945	7	3	12	1	—	—
1946	12	3	22	5	—	—
1947	10	—	—	—	—	—
1948	1	1	—	—	—	—
1949	28	26	—	—	—	—
1950	28	28	—	—	—	—
1951	22	22	—	—	—	—
1952	—	25	50	57	—	—
1953	—	—	*40	*376	—	—
1954	—	—	—	**208	—	—
Totals	119	114	130	648	8	35

* Demerara-Mauritius Seedlings (121), Demerara-Barbados Seedlings (255).
** Demerara Seedlings (12), Demerara-Barbados Seedlings (196).

B.W.I.S.A. CONFERENCE ON SUGAR TECHNOLOGISTS, ETC.

The Sugar Agronomist attended the Conference of the British West Indies Sugar Technologists' Association which was held in Barbados in 1955. He also attended meetings of the Advisory Committee, B.W.I. Central Cane Breeding Station, Barbados, as alternate for the Director of Agriculture, British Guiana, who was unable to be present.

FINANCE.

The sum of $62,240 was voted from the funds of the Sugar Experiment Stations' Committee for the operation of the Station during the year. The total expenditure for 1955 was $54,736.64 of which amount $1,914.43 was used for wages in connection with Leaf Scald Disease Investigations. This amount was refunded by Government. The actual expenditure for operating the Station in 1955 was therefore $52,822.21.

Receipts from assessments for the year were $33,449.08; those from the sale of canes amounted to $26,053.94, while miscellaneous receipts were $8,400.36.

MISCELLANEOUS

Statistics for recent years pertaining to the number of field experiments laid down and harvested; cane cuttings distributed; samples analysed, etc., are presented in Table II.

The Experiment Station was visited by a party of Students from the Imperial College of Tropical Agriculture, Trinidad, under Professor A. B. Killick. The Station was also visited by several persons from abroad and by those connected with the local sugar industry. Amongst the former were, Dr. H. Schroo and Mr. D. Greenwood.

ACKNOWLEDGEMENTS.

As in the past, close contact was maintained between the Industry and the Staff of the Sugar Experiment Station.

The cordial co-operation of the Staff of the Sugar Estates and of the Sugar Experiment Station is very gratefully acknowledged.

L. S. BIRKETT,
Sugar Agronomist.

TABLE II.— **Statistics of Seedlings, Cane Distribution, Field Experiments, Cane and Soil Samples, Cane Sold and Visits Paid to Estates, 1946—1955.**

Year.	Seedlings Basketed.	Cane Cuttings Distributed.		Field Experiments.		Cane Samples.		Soil Samples Taken.	Cane Sold to Pln. Ogle.		No. of Visits to Estates.
		No. of Cuttings.	No. of Bags.	Started.	Harvested.	No. Taken and analysed.	Cane Crushed (Tons).		Deliveries (Tons).	Net Receipts. $	
1946	3,896	447,230	3,671	55*	111†	505	15	51	1,750.20	8,776.95	177
1947	—	172,900	1,330	27*	64†	403	15	18	2,153.37	9,542.47	211
1948	—	347,230	2,671	37	54	476	12	290††	2,232.05	9,892.36	162
1949	—	310,180	2,386	28	62	953	22	14†††	2,535.19	15,892.34	154
1950	—	105,720	1,762	18	65	719	24	—	3,135.25	20,080.18	154
1951	—	123,540	2,059	14	71	654	22	—	3,344.50	24,443.64	89
1952	58**	174,420	2,907	32	62	1,102	30	—	2,794.20	22,274.61	80
1953	1,133***	104,640	1,744	27	63	1,015	37	—	3,345.20	31,255.78	88
1954	8,797****	132,120	2,202	33	80	1,076	31	—	3,524.49	28,698.86	82
1955	3,149*****	139,200	2,320	29	86	1,680	44	—	3,488.40	28,561.15	83

1946 *Includes 30 Maize Micro-plot Experiments.
1946 †Includes 39 " " "
1947 *Includes 5 " " "
1947 †Includes 5 " " "
1948 ††Includes 201 Sent to I.C.T.A.
1949 †††Sent to Yale University.
1952 **Demerara Crosses.
1953 ***Mauritius "Fuzz".
1954 ****Barbados "Fuzz".
1955 *****Barbados Fuzz (2,982) and Demerara Crosses (167).

THE HISTORY OF LEAF SCALD IN BRITISH GUIANA, 1950-1956.

BY

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A review of the history of leaf scald disease in British Guiana appears a suitable means of presenting the main aspects, problems and achievements in concise form.

Leaf scald disease was first observed in British Guiana on Pln. Uitvlugt by Messrs. J. M. Campbell, and R. R. Follett-Smith in 1950. Later in the same year Mr. W. T. Dale (2) of the Imperial College of Tropical Agriculture made positive identification of the disease and recommended control measures. Following this, Hutchinson (3) visited the Colony in 1951 and laid down the first variety resistance trials with varieties available at the time at the British Guiana Sugar Experiment Station, while Stevenson (8) made observations on the distribution of the disease. Abbott and Wiehe (1) recommended detailed control measures and proposed a general outline of the studies which they considered necessary to undertake. Wiehe (1, 10, 11) who spent several months in British Guiana, carried out the first detailed surveys and was instrumental in the creation of the Division of Plant Pathology within the Department of Agriculture, as a "permanent organisation to study sugar cane diseases."

In 1951, over 60,000 acres were planted in varieties which were very susceptible to leaf scald. The threat to the industry was therefore serious. Wiehe suggested that the susceptible varieties in cultivation should be replaced as as quickly as economically possible by the varieties B.37161, B.41227 and B.4098. These varieties showed considerably more resistance to leaf scald than the major varieties in cultivation at that time.

Both Wiehe, and Robertson (5, 6) presented data to show that the weights of healthy stools were significantly greater than those of diseased stools and rated varieties which had been tested for their resistance to leaf scald into four categories. Robertson demonstrated that rats were efficient natural vectors of the disease. By 1952, the area planted in susceptible varieties was reduced to 55,000 acres, while the area planted into susceptible — tolerant varieties increased from 8,000 in 1951 to 19,000 acres in 1952.

In 1953, Spence (7) created a fifth "resistance" category to accommodate varieties which appeared as intermediate between susceptible and tolerant in their reaction to leaf scald. He called this category susceptible-tolerant. Spence also laid down yield reduction trials to assess the losses due to the disease under field conditions. The area planted in susceptible or very susceptible varieties was reduced to 44,000 acres.

1954 was the first year in which no B.34104 was planted in the Colony. Several newly imported varieties *e.g.* M.112/34, Trojan, Comus, and N.C.O. 310, proved susceptible to leaf scald. In addition, the variety Pindar which is rated as resistant to leaf scald in Australia contracted the disease under field conditions in British Guiana. Pindar is now rated as susceptible-tolerant in British Guiana. The yield reduction trials laid down by Spence were harvested. Significant reductions were recorded for tons cane per acre and tons pol per acre in the variety B.34104 under the experimental conditions of one locality. (4). The area planted in susceptible or very susceptible varieties was reduced to 29,000 acres.

Severe natural infections of the two varieties H.37-1933 and N.C.O.310 were recorded in 1955. In the case of H. 37-1933, there was some hesitation by planters in believing that the symptoms observed were really those of leaf scald, as the estate on which the symptoms were first observed had been freed from very susceptible varieties and it was believed that the estate was practically "free" from leaf scald. Further, this variety is rated as resistant to leaf scald in Hawaii. The presence of the pathogen in the diseased material, however, has been established. By 1955, the acreage in very susceptible and susceptible varieties was reduced to 13,000 acres. The change in the varietal distribution for the period 1950 to 1956 in relation to their leaf scald resistance rating is shown in Table I.

With the marked reduction in the acreage under susceptible varieties, the immediate threat to the industry has been greatly reduced. It would be unwise however, to consider that leaf scald has been eradicated from the country, since a resistant or a tolerant, or a susceptible-tolerant variety may have individual stools which are infected but symptomless, or show only inconspicuous symptoms. It is only under conditions unfavourable to the growth of the cane plant that severe leaf and stem symptoms develop. These affected stools serve as loci of infection and with the re-introduction of susceptible varieties, the disease is quickly spread from the resistant to the susceptible varieties.

It is only with the commercial cultivation of varieties which are highly resistant or immune to the disease, that leaf scald will be controlled in British Guiana as it has been in other countries. This will of necessity be a long term project, for varieties must be produced which combine desirable agronomic and cultural characters with high resistance to leaf scald. A breeding programme has already been commenced with this object in view.

In the meantime, it would be of great benefit if planting material of new varieties should be derived from fields which are expressly established as nurseries. These nurseries must be rogued carefully. It should be pointed out, however, that in certain parts of Australia it has been proved that the rogueing of varieties which are moderately susceptible to leaf scald gives no assurance of clean seed (9). Even though no visible symptoms can be seen in material which is being drawn down for planting, some stools may be carrying the disease in latent form. Because of this, cutting knives should be sterilised during the planting operations, until highly resistant varieties are obtained.

To date, 275 commercial varieties have been rated for their reaction to leaf scald. These ratings are presented in Table II.,

TABLE (I).—COMPARISON OF AREAS UNDER VARIOUS CANES IN BRITISH GUIANA FOR THE PERIOD 1950/1956.

Variety.	Leaf Scald.	1951		1952		1953		1954		1955		1956	
		Acreage.	% of tot.	Acreage.	% of tot.	Acreage.	% of tot.	Acreage.	% of tot.	Acreage.	% of tot.	Acreage.	% of tot.
B. 34104	Very Susceptible	47,352.75	67.38	46,213.70	60.21	37,524.81	47.75	24,786.39	30.98	10,237.05	13.20	2,205.7	2.90
D. 14/34	,, ,,	10,518.72	14.97	6,602.57	8.60	3,854.83	4.91	2,007.47	2.51	633.85	.80	124.0	.16
Co. 419	Susceptible	1,914.03	2.72	1,319.26	1.72	1,074.01	1.37	1,231.72	1.54	1,050.12	1.40	1,094.1	1.40
D. 142/41	Very Susceptible	976.06	1.39	1,211.23	1.58	1,276.76	1.63	1,031.97	1.29	600.98	.80	264.0	.34
D. 62/43	Susceptible	3.68	.01	76.46	.10	208.26	.27	339.10	.42	410.35	.51	276.6	.40
Other Canes	Susceptible & Very Susceptible	132.54	.19	132.80	.17	72.48	.08	365.28	.45	495.69	.61	753.0	.91
Total	Very Susceptible & Susceptible	60,897.78	86.66	55,556.02	72.38	44,011.15	56.01	29,761.93	37.19	13,428.02	17.32	4,717.4	6.11
B. 37161	Susceptible—Tolerant	2,640.90	3.76	7,195.30	9.37	11,326.40	14.41	15,088.20	18.86	23,534.83	30.30	30,936.6	39.90
B. 41227	,,	2,582.02	3.60	9,754.66	12.71	17,064.24	21.72	24,427.33	30.53	26,080.59	33.60	24,096.7	31.10
Co. 421	,,	2,467.44	3.51	1,620.96	2.11	638.27	.81	82.19	.10	15.00	.02	36.0	.05
Diamond 10	,,	619.77	.88	349.88	.46	8.62	.01	17.34	.02	11.00	.01	11.0	.01
B. 4362	,,	—	—	50.35	.07	362.70	.46	1,565.49	1.92	3,433.72	4.41	3,513.1	4.50
D. 49/41	,,	180.87	.26	193.59	.25	200.53	.26	100.58	.13	31.00	.05	14.0	.02
D. 26/39	,,	28.90	.04	1.31	.00	1.31	.00	—	—	—	—	—	—
Other Canes	,,	—	—	—	—	—	—	—	—	61.00	.08	1,244.7	1.62
Total	Susceptible—Tolerant	8,465.90	12.05	19,166.05	24.97	29,602.07	37.67	41,281.13	51.60	53,167.14	68.47	59,852.1	77.20
P.O.J. 2878	Tolerant	288.40	0.41	188.23	.25	147.03	.19	78.72	.10	26.00	.03	3.0	.00
B. 40105	,,	101.20	0.15	372.89	.49	558.61	.71	598.43	.75	1,236.82	1.60	631.2	.80
D. 158/41	,,	81.77	0.12	224.18	.29	330.75	.42	434.54	.54	409.70	.50	246.0	.32
B. 4098	Resistant	178.40	0.25	997.50	1.30	3,584.80	4.56	7,322.03	9.15	7,679.89	9.91	5,999.7	7.70
B. 47225	,,	—	—	—	—	1.31	.00	116.11	.15	1,019.46	1.30	3,606.4	4.70
B. 47258	Tolerant	—	—	—	—	—	—	—	—	40.00	.05	675.1	.90
B. 46378	,,	—	—	.26	.00	8.61	.01	53.51	.07	193.03	.30	506.4	.70
B. 47379	Resistant	—	—	—	—	—	—	—	—	14.00	.02	417.7	.50
Other Canes	Tolerant & Resistant	13.35	.02	49.39	.06	53.34	.06	59.23	.07	114.00	.10	465.0	.59
Total	Tolerant & Resistant	669.12	.95	1,832.45	2.39	4,684.45	5.95	8,662.57	10.83	10,732.90	13.81	12,550.5	16.21
Other Canes not rated		237.98	.34	202.26	.26	282.93	.37	301.99	.38	277.0	.40	378.0	.48
Grand Total — — —		70,270.78	100.00	76,756.78	100.00	78,580.60	100.00	80,007.62	100.0	77,605.06	100.00	77,498.0	100.00

TABLE II.

RATINGS OF VARIETIES TESTED FOR RESISTANCE TO LEAF SCALD.

Very Susceptible.	Susceptible.	Susceptible —Tolerant.	Tolerant.		Resistant.	
			Barbados Seedlings.			
B. 34104	B. 40102	B. 37161	B. 37172	B. 47216	B. 3337	B. 47214
4409	4226	41227	40105	47217	4098	47225
4410	4448	41211	4214	47258	4304	47262
4411	44254	4306	41211	47314	4373	47379
4466	44279	4362	43253	47397	43330	48259
44244	4504	43214	43391	47399	44182	48375
44341	4553	43229	43413	4847	44278	4905
4502	45151	43349	44111	4851	45188	4906
4608	4691	4506	44165	4867	4668	4945
4692	46340	4572	44269	4881	46116	49122
46281	46369	4604	4530	4888	46288	49257
47147	4733	4699	4534	4893	46295	49376
47233	4755	46136	4556	4895	46308	49380
47256	47179	46144	4596	48228	46399	5041
48125	47306	46230	45137	48231	4710	5047
48177	47348	46232	45152	48232	4738	50126
48179	47419	46339	45156	48372	4743	50135
48350	49119	46351	45270	48384	4746	50184
4968	49377	4724	4681	4942	4764	50267
49166	50109	4744	4688	4956	4765	50345
49186	51168	4781	46102	4966	4788	50370
49229	51311	47298	46103	4995	47151	50377
49353	5124	47380	46150	49197	47162	
5011		48351	46151	49309		
5019		4970	46190	49355		
5073		49301	46218	5028		
50112		49354	46248	5037		
50153		49388	46290	5098		
5121		50155	46293	50115		
51105		50275	46297	50141		
51153			46378	50166		
51155			46384	50210		
51167			46394	50268		
51178			4711	50311		
51190			4747	50347		
51259			47135	50352		
51353			47204			
			Demerara Seedlings.			
D. 14/34	D. 36/43	D. 26/39	D. 158/41	D. 132/45	D. 31/46	
142/41	39/43	49/41	4/43	170/45	49/46	
27/45	51/43	18/43	54/43	3/46	127/45	
56/45	55/43	10/44	1/44	9/46		
62/45	58/43	173/45	3/44	106/46		
123/45	62/43	2/46	7/44	133/46		
6/46	27/44	141/46				
83/46	37/45					
150/46	87/45					
	139/45					
	153/45					
	19/46					
	20/46					
	29/46					
	183/46					
	259/46					
	275/46					
	277/46					
			Other Canes.			
M. 112/34	Co. 419	Diamond 10	Eros		M. 134/32	
Trojan	Comus	Co. 421	M. 213/40			
C.P. 44-155	N. Co. 310	Pindar	423/41			
F. 36-819	Q. 28			P.O.J. 2878		
				2967		
				3016		

A relatively large number of these varieties have proved tolerant or resistant to the disease under test conditions. It is unfortunate that many of the promising commercial varieties have proved susceptible to the disease. On the other hand, the relatively large percentage which has proved tolerant and resistant to the disease under test conditions offers considerable hope for the future. It is only a matter of time until the Breeding programme produces desirable varieties which are resistant or tolerant to leaf scald in British Guiana and complete control of leaf scald established.

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